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Local to Global and Back Again: A Comparison of National Special Education Policies to a World Model

by

Danielle Elaine Fleming

A dissertation submitted in partial satisfaction of

the requirements for the degree of

Joint Doctor of Philosophy
with San Francisco State University

in
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of the

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Committee in charge:

Professor Bruce Fuller, Chair
Professor Heather Haveman
Professor Pamela Hunt

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Abstract

Local to Global and Back Again: A Comparison of National Special Education Policies to a World Model

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Danielle Elaine Fleming

Joint Doctor of Philosophy in Special Education

University of California, Berkeley
San Francisco State University

Professor Bruce Fuller, Chair

The United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006), Article 24, stipulates that children with disabilities should have access to and benefit from public education. As of this writing, 177 countries have ratified the convention (United Nations Department of Economic and Social Affairs, 2018). However, little is known about whether the extent or features of national policies lead to greater identification and enrollment of children with disabilities (CWD) in formal schools. This study will describe one possible mechanism for the diffusion of public education for CWD through national or regional legislation for special education by countries participating in the CRPD (2006). The analysis will compare cross-country enrollment rates for CWD with prominent topical themes in country or regional legislation using structural topic modeling methods. Additionally, the analysis will examine correlations between enrollment rates, prominent topics, and meta-data (other relevant variables) identified as significant in the literature on policy diffusion. The data presented here may inform the special education field about the extent and effects of the global diffusion of education policies for CWD. The analysis may also extend world culture theory in sociology, detailing the use of international documents to influence policy language around the ideals of education for CWD.

Keywords: text analysis, special education, enrollment, world society theory, institutional logics

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Chapter 1

Introduction

The World Health Organization (WHO, 2011) estimates that children with disabilities (ages 0-14) account for 93 to 150 million people in the world. The international movement to include children with disabilities (CWD) in public education was outlined in the United Nation's Convention for the Rights of Persons with Disabilities (CRPD) in 2006. The CRPD is a legally binding document ensuring the rights of persons with disabilities. These rights include: protection from discrimination, respect for individual's autonomy and right to make personal choices, inclusion and participation in society and public life, accessibility (including reasonable accommodations), equality of opportunity (including the right to work and access to adequate standards of living), equality between men and women, freedom from torture and abuse, equal recognition before the law, and the protection of the rights of children with disabilities. Further, the CRPD outlines processes for data collection, international cooperation, and monitoring mechanisms. As of 2018, 161 countries or regional integration organizations (such as the EU) have signed the CRPD and its Optional Protocol (United Nations Department of Economic and Social Affairs, 2018). The Optional Protocol provides a complaint and enforcement process for the CRPD. Reports of violations may be made confidentially to an international committee. The nation state is then provided with the committee's report, to which it may respond. Additional countries have ratified (made legally binding) the Optional Protocol or CRPD. The CRPD broadly protects the equal human rights of people with disabilities (PWD) and enjoins the removal of barriers to access and enjoyment of equality. Article 24 of the CRPD states that children with disabilities have a right to be included in general education systems with appropriate supports to obtain access to learning.

In order to obtain this right to education, many countries have instituted federal or regional legislation and organizations to ensure that CWD are given access to educational facilities. Some countries had educational supports for CWD in place before the CRPD that have promoted public education for these students. As an example, the United States had the Individuals with Disabilities Education Act in 2004, as well as previous legislation protecting and promoting these rights. Parents have used these federal laws to litigate for their children's access to public school education. Additionally, grants have been offered through federal programs in order to study and improve CWD's access to education. Finally, even as the federal government has devolved many of the responsibilities of education to the states, reauthorizations of IDEA have included increasingly specific language about the "incidental benefits" of inclusive education (Sailor, 2002), and Supreme Court rulings (Endrew v. Douglas, 2016) have elaborated that CWD must educationally benefit from the services they receive in public schools. This example helps to exemplify why federal and regional legislation governing the provision of education services for CWD are the focus of analysis for this study. In some national cases, these laws may be the lever through which families of CWD may obtain public education benefits and changes to the educational system.

This study will utilize four major sources of data: national legislation governing public education for children with disabilities, quantitative data on school enrollment for CWD, related meta-data variables (including percentage of GDP spent on education, parts of the CRPD signed, and other variables described below), and the CRPD itself. Two primary research questions will drive the study. First, can structural topic models (Lucas, Nielsen, Roberts, Stewart, Storer, & Tingley, 2015; Roberts, et al., 2014) be used to predict which national policies for special education are more closely aligned with the topics of the CRPD? Structural topic models are

algorithms for analyzing large sets of text data, or corpuses. A structural topic model searches for words and phrases that are likely to be associated with each other and organizes them into "topics" which are then coded and named by the researcher. The structural topic model is used to identify topics with high or low correlation to related variables associated with each document. Further description of the structural topic model will be forthcoming in the following chapter. The second research question asks: do the countries whose legal protections include language more closely aligned with the CRPD have higher public education enrollment rates for CWD in schools? This question will be answered by comparing the topic most strongly associated with the CRPD and meta-data associated with each national document, including the percentage of CWD enrolled in school. Information obtained by answering these two questions, should help to shed light on the extent to which alignment with the CRPD results in measurable participation for CWD in public education.

The study will proceed as follows: first, theories informing these studies will be described, including world polity theory (Meyer, Boli, Thomas, & Ramirez, 1997), neo-institutionalism (DiMaggio & Powell, 1983; Meyer & Rowan, 2006), and institutional logics (Friedland & Alford, 1991; Thornton, Ocasio, & Lounsbury, 2012). These theories may help to explain why the language used in national legislation may be related to enrollment rates for CWD in public schools. Then, previous studies informing analysis will be discussed, followed by the proposed methods of analysis. These will include computer-assisted content analysis strategies and correlational regression methods to compare the topic content of national or regional special education policies with national or regional public-school enrollment rates for CWD. Topic content related to higher enrollment rates may be associated with language related to citizenship (PWD having equal rights as others), human rights, or educational structures and resources. Then, the data provided will be examined to describe the contents of topic features correlated with high vs. low enrollment of CWD. Finally, implications of the results for world society theory and institutional logics theory will be discussed, as well as the limitations of this design and areas for future research.

The Convention on the Rights of Persons with Disabilities (2006)

The CRPD offers guidelines for the way CWD should be treated. Some important aspects of the CRPD for children are provisions for being counted in national census data, additional protections from violence and consideration during war and natural disasters, the right to participate in decisions affecting them, the right not to be separated from their parents against their will, and the right to the same free and compulsory primary education as their typical peers (CRPD, 2006). The language of the CRPD Article 24 stresses that educational opportunities are requirements for the full development of human potential, dignity, self-worth, and freedom. The conference also strongly stated that all individuals, including those with disabilities have the right to personal development, exploration of talents, and the opportunities to engage their mental and physical abilities to their fullest potential. The signatories consider this to be a necessary component of citizenship, allowing for the participation of this population in a free society.

Nation-states that have signed CRPD agreed to implement policy change in order to offer universal completion of primary education to all children, including those with disabilities. This agreement complements the Education for All Millennium Development Goal 2, to achieve universal primary education (United Nations, 2010). The rate of policy adoption and implementation by signatories of the CRPD can be partially explained using sociological perspectives.

World Society Theory

World society theory was described by John Meyer and colleagues (1992) as emphasizing the role of transnational institutions in shaping the behaviors and structures of nation states and their citizens on a global scale. Within the theory's framework, institutions, including national governments, institute actions and procedures based on a world model established through transnational institutions. The authors documented one instance of this congruence with world models through their quantitative study of the spread of mass education.

Meyer and colleagues (1992) described the spread of mass education as a piece of a transnational cultural model wherein schooling for the masses is a symbol of progress linking individuals to their nation-states. Further, they describe mass schooling as representing the progress of a nation through the following processes:

> [Public education's] collective standardization celebrates the unified sovereignty and purposiveness of the collectivity (the state), its individual focus and universality enact the integrated and universal character of society (the nation of citizens), and its secularized culture defines the character of the nation-state as an enterprise that is designed to attain progress (p. 131).

The authors describe the spread of mass education as a signal of progress that reinforces the value of the individual to the nation state through rational institutions such as schools that signal a shared commitment to the well-being of the nation's citizens and to the ideal of "freedom" through publicly available opportunities. The spread of mass education has been nearly ubiquitous since the end of WWII, resulting in explosions of primary education enrollment growth (Meyer, Ramirez, & Soysal, 1992).

Meyer and colleagues (1992) used a minimum mass education enrollment threshold of 10% as an indicator that nations had acquired the purposes and arrangements of mass education. Though the percentage of CWD is not yet equal to the number of non-disabled children attending schools, the minimum threshold for national aspiration to the public education model has been surpassed. This indicates that in many of the countries participating in the reporting procedures, public education expansion for CWD has been underway for some time.

The same can apparently be said for the spread of mass education for CWD since the UN adoption of CRPD (WHO & World Bank, 2011). Public education for CWD, in this study, will refer to any form of publicly funded education for students with disabilities that may or may not include specialized services and supports relevant to their disability and accompanying support needs. However, there is still a lack of information regarding the spread of public education for CWD in many countries which can be attributed to the lack of national census questions related to children's disability status (UNICEF, 2013). Nevertheless, as monitoring attempts spread, the enrollment numbers of CWD continue to climb. The fact that many countries define "disability" differently and the stigmatized status of people with disabilities (PWD) in many cultures do not seem to be significant impediments to CRPD signatories working to promote the rights of PWD in education policy reforms and implementation practices. Across 51 countries surveyed in the 2011 WHO and World Bank report, 50.6% of male CWD and 41.7% of female CWD had completed primary school education. This number compares favorably to the number of non-disabled children completing primary school in the countries reported (male: 61.3% and female: 52.9%). However, without looking more closely at individual countries' data the aggregate numbers may be hiding a superficial, rather than substantive, commitment to promoting the

rights and educational access of people with disabilities. Another lens through which to see these progressive shifts in service provision and organization will be examined next.

Neo-institutionalism

Institutional theory is used to describe why one institutional form or structure is adopted rather than another and what message is promoted by those forms or structures (Meyer & Rowan, 2006). Researchers in this theory are interested in looking for the sources of institutional change. According to Meyer and colleagues (1997), the institutionalization of world models (models instituted by international governing bodies) explains many aspects of the growth of mass education, including structural isomorphism. Dimaggio and Powell (1983) described structural isomorphism as a set of processes by which institutions become similar. They described three processes by which this outcome may be obtained: through coercion, mimesis, and normative means. However, in the case of mass schooling, Meyer, Ramirez, and Soysal (1992) found that coercion could not explain the extensive growth of student enrollment, as countries in what could be seen as a resource dependent state adopted mass education policies at a comparable rate to more independent countries. Furthermore, these patterns of growth could not be explained by traditional functionalist models, informed by concepts of resource dependence, the exercise of power hierarchies, structural location, or similarities in traditional contexts.

Meyer and colleagues (1992) found that countries with external linkages to international organizations (like the United Nations) were likely to develop mass schooling efforts independent of local nation-state conditions. They hypothesized that this was due to the central organizations functioning as modern state-like forms on which countries model their policy adoption and structuration behaviors. Close linkages of this type were found to provide the participating country a structure for the project of nation building.

In the study described, the authors attempted to control for the nations' structural location within the world polity by parceling out countries at the core of the U.N. (Western democracies), those more peripheral to the U.N.'s formation, then the main colonies and dependencies of the core powers, until reaching a final far periphery of colonies not attached to Western democracy (the hypothesized source of the value of mass education). The authors found, however, that nations' structural location within the world polity made no difference to the rate of enrollment in mass schooling.

This surprising finding counters some of the intuitive assumptions of neoinstitutionalism. While institutionalism theories rely on three processes causing isomorphism: mimetic, coercive, and normative processes, not all of these processes affected the proliferation of mass schooling. The rate of adoption was not associated with coercive mechanisms such as resource dependence (Pfeffer & Salancik, 1978). Additionally, the authors attempted to control for country characteristics including urbanization, racial composition, religious composition, ethnolinguistic fractionalization, and the previous existence of a mass education policy, but again, found no association between these contextual factors and the spread of mass education. Instead, the primary predictor of national mass education enrollment was based on a common institutional (mimetic and normative) force, participation in a world model, rather than through contextual factors (such as coercion or resource dependence). Therefore, observers might expect to find that signing or ratification of the CRPD and/or its optional protocol is a sign of the spread of enrollment in national public-school systems for CWD, regardless of national contextual factors, either from the top down (countries attempting to meet the international standard of progress) or

from the bottom up (from progressive movements already in effect in the countries that have signed).

Similar to the studies of these authors, the provision of education opportunities to CWD can be seen from an institutionalist perspective as nation-states model education structures after worldwide models (Meyer et al., 1997). Therefore, it is hypothesized that national or regional legislation governing the provision of educational services to CWD will have significant topical correlations to the language of the CRPD (either due to the country's lawmakers helping to frame the CRPD, or due to mimetic and normative influences of the CRPD on the writing of new legislation). Further, nations with laws that closely mimic the language of the CRPD may have higher enrollment rates of CWD in public education. The next section on institutional logics theory helps to shed light on why this may be the case.

Institutional Logics

Institutional logics theory suggests that once a model has been adopted, actors will organize and structure their actions around these dominant beliefs. This has been shown empirically in the changing logics of the early thrift industry (Haveman & Rao, 1997) in which actors were seen to modify authority structures, goals, technologies, and product offerings to fit a new model of a larger social sphere due to changes in the technical and institutional environment of the time. Similarly, Dunn and Jones (2010) found that the science logic in medicine (treating the disease) was supplemented by a logic of care (emphasizing the whole patient) through the influence of public reports and discourse referring to use of the vocabulary of "care" and "science."

In their study, the authors systematically reviewed professional journals for references to each of the two competing logics using content analysis. Using word frequency counts, they were able to compare the usage of these terms, to the rise and fall of different types of schools (public health for the "care" logic vs. medical schools for the "science" logic). They found that the prominence of the care logic was able to predict the rise in public health schools over time. Similarly, it may be expected, that the rise of the inclusion/social logic (likely to be evident in the prominence of particular topics in each piece of legislation) for CWD, will correlate with increased enrollment for this population in public education environments, while decreasing the number of children served in isolated medical facilities, or without services at all. It would also be expected that this rise in enrollment is proportional to the dominance of the inclusion logic. The prevalence of topics in legal documents may be measurable through the use of structural topic models, offering a more nuanced description of the use of language and its correlation with measurable social actions (such as public education provision).

Thornton and Ocasio (1999), as cited in Haveman & Gualtieri (2016) described the operation of actors within institutional logics as a form of "embedded agency" in which the actors, organizations, fields, or social sectors may use logics to both guide and justify actions. In the study proposed here, the primary interest is the change from the medical model logic to the inclusion/social logic model in the education of CWD in countries that are signatories of the CRPD or its optional protocol. Signatory nation-states will likely have implemented system-wide, legislated, organizational changes in the structure of their education systems reflecting the new logic of inclusion.

Institutional logics are cultural beliefs and rules that shape the cognitions and behaviors of actors (Friedland & Alford, 1991). The inclusion/social logic can be seen as governing the treatment of CWD in educational systems, and of the rights of people with disabilities (PWD) to be full participants in broader society more generally. Many who use the term define social

inclusion differently. But the history of its use in this country can be traced to United States' Handicapped Children Act of 1975 (P.L. 94-142) which mandated a "free and appropriate education for all handicapped children" and to the later revisions to the law offered through the Individuals with Disabilities Act (IDEA), which mandated that placements for these children be provided in the "least restrictive environment," generally understood to be the general education classroom. Just as separate settings for children of color were found to be unequal and inferior to integrated settings through Brown v. the Board of Education (1954) inclusion was seen by advocates as "a way of life, a way of living together, based on a belief that each individual is valued [and belongs]" (Villa & Thousand, 1995, p. 11).

In the larger world community, it is possible to observe direct actions and proclamations of nation states to align with the symbols, beliefs, and values that shape state policy. Friedland and Alford (1991) predicted that, "the institutional specificity of state power should be clearest when it is being transformed" (as quoted in Powell & Dimaggio, 2012, p. 238). These changes may be seen in policies that are directly linked to participation in international organizations where policy recommendations are clearly delineated. Friedland and Alford predicted that participation in social relations (in this case, of nation-actors in a world community) would be governed not only by material interests, but also through shared, co-constructed symbolic meaning.

The inclusion/social logic stands in stark relief to the medical logic which preceded it, through which CWD were seen as requiring separate systems to remediate physical and mental flaws (Conner & Ferri, 2007). Table 1, below, describes the different values and procedures informing the two logics in special education. The inclusion/social logic was applied to anti-discrimination policies, accessibility regulations for public buildings, and education (Winter, 2003). In education, the term "inclusion" is generally understood as access by CWD to the same educational settings and curricula as their nondisabled peers with the provision of specialized services and supports to promote learning and social integration (Hunt & McDonnell, 2007). Research evidence supporting inclusion's educational outcomes has been mixed (depending on the population and context), due to a lack of valid measures for many students with disabilities, as well as a lack of standardization in service provision and reporting (Hattie, 2009; Hunt & McDonnell, 2007; Saebones, 2015). Advocates have nevertheless worked at every level to increase inclusive education for CWD, based on the stated belief of signatories to the CRPD that the normalization of disabilities as a part of human existence will increase opportunities, decrease discrimination and abuses towards PWD, and improve research on educational outcome measurements for CWD (Saebones, 2015).

Table 1.

Institutional Logics in Special Education

Inclusion/Social Logic	Medical Logic
-Exclusion of people with disabilities results in negative quality of life outcomes (stigmatization, lack of access to means of economic mobility through education).	-Segregation of people with disabilities is required for their protection. -The eradication/curing of disabilities is the goal.

-Disability is a normal part of human experience with which society should become familiar. -Accessibility supports required by people with disabilities are beneficial to all people. -Exclusion of PWD is more expensive than inclusion, due to increased dependence on family caregivers and welfare systems. -Inclusive settings are seen as addressing the needs of the "whole child." -Disabilities are often socially constructed more than physically determined. -People with disabilities should be included in decisions made about them, summed up in the motto, "Nothing about us, without us." -Characterized by the use of "person-first" language, which stresses the importance of shared humanity before the distinction of exceptionality.	-People with disabilities require specialized services that are easier to provide in segregated settings. -Segregated settings are seen as addressing specific needs stemming from the disability. -People with disabilities are not seen as capable of making informed decisions about their own lives. -People with disabilities are treated as a pathology first, a person once cured.

Note. These institutional logics of education for students with disabilities are largely modeled on descriptions of the shift from the medical model to the inclusion model in the United States, described by Connor and Ferri (2007).

In the study proposed below, the methods are designed to show that the institutional logics determining student services for CWD (whether educational or medical), can be predicted by computer-assisted content analysis of national policies adopted by countries that are signatories of the CRPD. This is of interest insofar as such measures, if correlated with enrollment rates, might provide another means of evaluating commitment to international treaties resulting in more progressive national policies. Additionally, since data on CWD enrollment has not yet been centralized into the UNESCO database, this proposal will provide comparative information on CWD enrollment and policies that are difficult to obtain through current international sources. Finally, the study will test a potential mechanism (federal legislation) of local expansion of world society models.

The Present Study

The present study is designed to describe a large corpus of national laws governing public education for CWD in 27 countries for which data were available including current laws, current (from 2004 to 2016) enrollment rates in public education for CWD, and the percentage of national GDP spent on education. By using structural topic models to compare legislation in

these countries to the Convention on the Rights of Persons with Disabilities (2006), it is hoped that descriptive (but not causal) information will be obtained to shed light on what ways these laws are associated with changes in the educational landscape for children with disabilities. Many factors might prevent laws from being implemented, and in the cases described regime change, natural disasters, genocide, and repressive law enforcement may contribute to some of the differences in enrollment rates seen in these countries. As disparities occur, an attempt will be made to identify some of the factors external to the primary analysis that may help to explain disparities that cannot be explained by the structural topic model analysis.

This study will contribute to the field of special education through providing an updated and comparable list of enrollment rates and a description of legislative factors that may lead to greater educational opportunities for CWD. While this study will be correlational in nature rather than causal and is limited to a small number of countries on which all variables were available for analysis, it is hoped that this type of analysis may be used in the future when more data become available through the work of international agencies attempting to standardize data collection for enrollment rates of CWD around the world.

Research Questions

Two primary questions guide this analysis:

(1) Can a structural topic model be used to describe the topical features of national legislation governing the provision of educational services for CWD?

(2) Is the correlation of document topic content to the CRPD associated with special education enrollment for CWD?

Chapter 2
Method

This chapter will describe various aspects of the analysis. First, the participant identification process and criteria will be elaborated. Second, a description of content analysis and its uses will be provided. This will be followed by a description of computer-assisted content analysis for large text corpuses. These descriptions will help to provide background on the first research question as to whether the structural topic model (STM) may be used to describe features of national legislation relevant for the provision of educational services for CWD. Third, the variables identified for use in the final analysis will be described as well as reasons for the selection of these variables. These variables will include available data on enrollment rates of CWD in public education, which will help to answer the second research question regarding whether the correlation of national legislation topic content to the CRPD, as described using STM topics, may be associated with public school attendance. Then, procedures for analyzing these variables using computer assisted text analysis will be enumerated. Finally, details about the selection of specific countries identified for further case study analysis will be described.

Participant Countries and Selected Documents

Participant countries and regions were determined through referencing the *Praeger Handbook of International Special Education* (Wehmeyer & Patton, 2017, hereafter *The Handbook*). The three-volume handbook contains entries for 74 countries/regions that are signatories to the CRPD. Each chapter is written by an education professional with personal experience in the educational practices for CWD in that country/region, including applicable laws used by professionals in the field. It was important that a special educator practicing in the country or region was able to identify the most important applicable laws, since many countries experience periods of turmoil in which laws that are "on the books" are rarely enforced or implemented by practitioners.

For each country, a Google search was conducted to find a digital copy of the single most relevant legal document identified by the chapter authors of *The Handbook* that guided the provision of a public education for CWD. These documents tended to fall within three categories: laws governing treatment of people with disabilities that include educational treatment, education laws, and constitutional amendments. Each set of documents was given preference in the order in which they are listed above, so that the final list of documents contained one single most important document for each country described. The order was determined by the likelihood of the relevance of the document to the public education of CWD within most countries in the sample.

While many laws exist in digital form, not all available laws could be processed for inclusion in this study. Laws were excluded if (a) a digital copy could not be obtained, (b) the digital copy was not readable using optical character recognition techniques with ABBY FineReaderPro (2013) if it was in portable document format (PDF), (c) a reliable government source for online documents was not available, (d) when translated using Google Translate into English (an acceptable pivot language for comparative text analysis studies, see Lucas et al., 2015) the document was not readable or exhibited the nonsensical qualities of "word salad" lamented by human translators (Hoffstedter, 2018). After documents were excluded using these procedures, 57 documents representing 57 of the 74 countries and regions in *The Handbook,* were identified for analysis (see Appendix B for a complete list). The identified documents were originally written in 23 languages. The largest group of documents (n=21) were originally

written in English, followed by Spanish (n=8), French (n=5), and Arabic (n=3). All other documents were the only document written in that particular language.

Content Analysis

Content analysis is a method used to describe large quantities of data, often available in digital form. Krippendorff (2013, p. 24) defines content analysis as "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contents of their use." Earlier analysts (Stone, Smith, & Ogilivie, 1966, in Krippendorff, 2013, p. 30) defined content analysis as "a research technique for making inferences by systematically and objectively identifying specified characteristics within a text." Another, similar definition specifies that, "Content analysis is a method for quantitative classification of communication content. Categories are derived from samples of the data (content) to address research questions. When properly constructed, the categories validly reflect the nature of the content and can be reliably coded by independent observers" (Berelson, 1952; Weber, 1985, in Miller, Fullmer & Walls, 1996, p. 100). With the advent of computerized search programs and databases, it has become possible to search large quantities of data in order to extract patterns of text related to observable outcomes in the external environment. Content analysis is often chosen as a method when the goal is to cover an expansive amount of data in order to predict general trends in a body of literature. Additionally, these methods can take external variables (such as enrollment rates) into account as related to the literature being analyzed.

Content analysis has frequently been used to show trends over time. Fiss & Hirsch (2005) used content analysis to show that structural changes in the U.S. global economy led to an increase in the use of the term "globalization" in U.S. newspaper and press release coverage between 1984 and 1998 and traced the valence of its usage by different interest groups represented in news stories. Miller, Fullmer, and Walls (1996) traced the use of the word "mainstreaming" in over 900 research and opinion articles from 1982 to 1989. They found an increase in the word's use from 1986 to 1989 with a focus on its relation to student behavior rather than to academic performance.

In this study, content analysis will be used to determine the predominant topics contained in legislation governing the provision of public-education for CWD. Specifically, structural topic models (Roberts et al., 2014), a form of computer-assisted content analysis will be used to extract dominant topics from the sample of laws. These models will also incorporate other relevant variables into the analysis (such as the percentage of the national or regional budget spent on education). Through this analysis, it is hoped that the relationships described (between topics and other relevant variables) will help explain the differences between legislation and implementation in varying countries and regions. Topics will be compared to the CRPD with other relevant variables (including enrollment rates, parts of the CRPD that were signed, and percentage of GDP spent on education) incorporated as potentially related factors for convergence or divergence from the CRPD.

Computer-assisted text analysis has been used in several comparative policy studies, indicating that it may be an appropriate tool to begin to answer the research questions that are the focus of this study. Miller (2013) used text analysis methods to compare topics expressed by United Nations speeches by representatives from colonized versus never colonized states. Budge and colleagues (2001) have used text analysis methods to describe topics covered in electoral manifestos across the globe. Nielsen (2013) uses text analysis methods to describe the prominence of the topic of "jihad" as associated with related variables in the writings of Muslim clerics (specifically, to the age of these clerics and their relationships to prominent teachers).

Nielsen found that the text of radical clerics was more likely to be written by younger clerics who had failed to establish working relationships with academicians in state-sponsored positions, making radicalism one of few alternate avenues where they might use their extensive qualifications in religious studies. In short, text analysis has been used to uncover a variety of relationships between texts and external variables of interest. Through using computer-assisted text analysis, the present study seeks to uncover a relationship between enrollment rates of CWD in public education and the content of national laws governing the provision of such services in terms of their resemblance to the content of the CRPD. Additionally, per previous research on the expansion of public-school enrollment, it is expected that certain variables will have no effect on the enrollment of CWD in public schools (percent of GDP spent on education). Certain topics identified through the STM analysis in national legislation may, however, be associated with higher CWD enrollment (as age and mentor relationships were associated with the topic of "jihad" in Nielsen's work).

Related Variables

Next, data regarding external variables likely to influence the provision of public education for CWD were sought. There were four variables other than the documents themselves that were used in the final analysis. The first variable included the year for which data could be obtained. Ideally, data would have been obtained for the same year across all countries, but currently, such data are not available. Researchers are currently working to create a standardized reporting system for enrollment data for CWD, but this development may take several more years. Therefore, the years for which data were obtained range from 2004-2016. Whenever possible, the year for which data were obtained for enrollment of CWD was matched to available data on the percentage of GDP spent on education. This was possible for all countries included in the final sample except for Nicaragua and Australia, where the two data points are staggered by one year each. See Table 2 in Appendix A for a complete list of all variables used in the final analysis as well as additional variables of interest including the type of law the country used to primarily guide provision of education services for CWD (education law addressing the education of children with disabilities, general education law, or constitutional amendment) and the original language of the document. The second variable was the percentage of children with disabilities enrolled in the identified year. The third variable was the percentage of GDP spent on education in that year. Finally, the fourth variable was the parts of the CRPD to which the country representatives had agreed by signing the document (the CRPD, its optional protocol, the ratification of the CRPD, or the ratification of its optional protocol). These parts were important as to some extent they represent a country's commitment to the CRPD. Signing the CRPD could be enacted by the representatives in attendance. Ratification typically occurs through a larger country legislative body or mechanism. The optional protocol outlines a process for filing international reports or grievances and could also be signed by a smaller contingent of representatives, while ratification of the optional protocol was typically enacted through larger state bodies. Therefore, this final variable ranged from zero (no parts signed) to four (all parts signed). Requiring all of these variables for inclusion in the final analysis further reduced the sample to 27 countries (included in Appendix A). The largest language groups represented in the final sample were English (n = 10), Spanish (n = 7), and French (n = 2), eight other languages were included in the final sample (using the English translated documents) each representing one country.

Measures

The structural topic model (STM) is designed to provide information about the relationship between text topics and their meta-data. The STM package for R developed by Roberts, Stewart, and Tingley (2014) uses distributions of documents, topics, and words with associated variables to create a description of a corpus of materials. The program extracts *topics* by determining patterns of words most frequently associated with one another. It does so essentially by looking at the words as a large matrix in which certain words are most likely to be associated with one another. While a corpus of documents may contain many topics, the researcher must determine the number of topics that may be best understood in terms of understandability or *coherence*. Semantic coherence in STM was defined by Minmo, Wallach, Talley, Leenders, and McCallum (2011) as a metric related to pointwise mutual information. The metric is meant to be a reasonable substitute for human judgment of coherent concepts contained in the texts. Topic models with semantic coherence should show that words under the same topic often co-occur with one another. However, later researchers found that (Roberts, et al., 2014) coherence alone was insufficient for specifying topics, as the metric tended to produce high frequency words that were not easily distinguishable from one another as sets of categories by human coders. Therefore, Roberts and colleagues (2014) proposed a metric for *exclusivity*. This metric causes the program to specify words that are most likely to be associated with one topic rather than another (with a frequency rate of .7 or higher in relative occurrence within the topic). With both specifications, the STM still relies on human coders to determine what the topics' overall meaning might be in terms of shedding light on both the language content of the corpus topics and interpreting the correlational relationships of the topics to the additional related variables. Therefore, the final topic names are manually determined by human coders. The package contains a number of tools for assisting the researcher to do so, allowing a comparison of different numbers and contents of topics, as well as a means for replicating the results by setting a seed once the most comprehensible model has been chosen.

Once the number of topics has been specified to the STM program, and the seed has been set for the model the researcher wishes to use, the program can use various measures to describe the corpus in terms of its related variables. *Topical prevalence* refers to how much of a document is associated with a given topic. The STM program will determine which documents are most representative of a given topic based on each document's topical prevalence. *Topical content* refers to the words associated with a given topic. *Related variables,* or the specified variables of interest that are outside of the document corpus but related to specific documents (such as the percentage of a country's GDP spent on education in a given year) may then be shown to correlate with specific documents (based on topical prevalence) or topics (based on topical content) in the corpus.

Related variables. Additional variables, known as meta-data in the STM package, were gathered for all 27 countries in the sample. The countries were determined through reference to *The Handbook* and included five countries in Asia, one country in Oceania, five countries in Europe, 8 countries in the Americas, and 8 countries in Africa. Of the 74 countries and regions in *The Handbook,* only those for which laws, percentage of CWD enrollment in public schools, and GDP for a comparable year could be obtained were included. A description of these additional variables follows, and limitations related to this method of selection of countries for analysis is included in the final chapter.

These related variables included type of law (general education, laws that address the education of CWD, or constitutional amendment), the original language of the document, the year data were obtained for enrollment rates of children with disabilities, the year data were

obtained for the percentage of GDP spent on education (only included countries where these two years matched within two years difference maximum), the percentage of children with disabilities enrolled, the percentage of GDP spent on education, and the parts of the CRPD signed by the country's representatives (0-4). Some of these variables were included in the STM analysis (the four listed in the previous section) as relevant to the outcome of interest (enrollment), and others were included in the table in Appendix A, for readers who may be interested in these additional summary data.

Procedure

Use of Google Translate. First, documents and related variable data were obtained through international agency websites or national government websites. Laws not originally written in English were translated using Google Translate. Google Translate has been considered a valid translation tool since the advent of neural machine translation (Wu, Schuster, Chen, Le, Norouzi, Mackeray, et. al, 2016, Ramati & Pinchevski, 2018).

Neural machine translation revolutionized machine translation by shifting from rule-based translation (teaching a computer rules of grammar and spelling, etc.) to probability-based translation (made possible by more available compute power than previously). Google Translate partially relies on the feedback of human translators through a separately personalized platform that learns the individual translator's preferences in translations. Additionally, Google Translate uses previously translated texts, often U.N. documents in multiple languages, to validate its attempted translations and create probable translations using statistical analysis. When the program finds that words, phrases, or sentences have been accepted as valid repeatedly (by a human translator, or through comparison to model translation documents), this strengthens the probability that this translation will be the one determined in similar circumstances. In short, Google Translate improves with feedback over time, and has been used in the last several years as a tool by professional human translators who provide feedback to the system, resulting in continuous improvement and near-human levels of translation. Methods of machine translation based on grammatical rules written before the advent of neural machine translation (Le & Schuster, 2016), which is now based on statistical probabilities, have been made obsolete.

Fortunately for this study, which relies on English translations, Google Translate still uses English as a pivot language. All languages are translated into English before being translated into another language, strengthening the accuracy of translation to English in this program from any other language above others (based on increasing knowledge and practice that the program has in English). The model used by Google Translate with English as a pivot language allows for what researchers call "one shot translation" in which the program can translate a language pair that it has never seen before. For example, if the translation program is able to translate German to English and Turkish to English, then it can extrapolate how to translate German to Turkish with a relatively low error rate. This allows for some more rarely spoken languages to be well translated, though a large training corpus in multiple languages may not be available (Le & Schuster, 2016).

Google Translate is limited in that it will usually choose the most statistically likely translation of a phrase. For this reason, it tends to be most accurate when translating business or legal documents and least accurate when translating literature with plenty of figurative language (though its translation of Hemingway is arguably almost indistinguishable from the original when cast from English to Japanese and then back again, Lewis-Krauss, 2016).

Cleaning the corpus. After translation, the data frame was inputted to R, including all related variable data mentioned above and the primary translated texts. Documents were then

processed to remove the most common English words that convey little content (e.g., a, an, the). Additionally, custom words were added to this list to make the most frequent topic words more relevant. For example, the words "chapter, section, subsection, etc." were added to this list so that the words used in the model were more meaningful, and less procedural. This *stop words* list is included in Appendix B.

Topic selection. Then, an initial STM analysis was run to find the ideal number of topics for the corpus using the model fit package in STM, as well as judgement by two human coders, to identify the best fit for exclusivity, frequency, and understandability of terms between 5-20 topics. From this process a 17-topic model was chosen as the best fitting and most understandable model. Topics in this model did not contain many overlapping terms and were determined to have sufficient thematic consistency to be used in the final model. Topics and their manually determined labels may be found in Table 5 in Appendix D. Though there are methods which allow for machine selection of the number of topics across a corpus (Lee & Minmo, 2014), this is not recommended by the STM authors as the number of topics extracted tends to be higher than is parse-able by human coders. The range of possible topics was selected and several options were run (between 5 and 20 topics) to find the number that seemed to most clearly fall into identifiable categories by the primary researcher and an assistant.

Extracting associations. Next, the STM regression estimation was initiated in order to search each document as a unit and the corpus as a whole, to determine which topics were most highly associated with related variables of interest (primarily enrollment rates of CWD). In order to explain how the STM package is able to do this, it is helpful to provide some information about topic models more generally. Topic models originally used a method in statistical text analysis known as the latent Dirichlet allocation, or LDA (Blei, Ng, & Jordan 2001, 2003). LDA determines a list of words (the "bag of words" model) and the probability that they are associated, in order to determine topics. These vocabulary words can be in multiple topics. Then, for each document, the LDA method assigns a proportionality of topics for that document.

STM further refines the LDA model by including a term in the equation for the marginal frequency of words within a topic that deviates from other topics for each term (*exclusivity,* as described earlier). The STM model uses a generalized linear model (GLM) to introduce this covariate information and look for correlations between topics and other variables of interest (Roberts, Stewart, & Airoldi, 2016). GLM models are used with data that are not assumed to have a normal distribution. The model does not assume a constant variance between the predictor variable (in this case, specific topics) and the response variable (in this case, enrollment rates). GLM models allow for arbitrary distributions that vary linearly with predicted variables, providing insight into the likelihood of a given outcome in terms of odds ratios (for example 4:1 odds of a given outcome) rather than an expected value.

In short, the STM package attempts to explain enrollment rates for CWD as an effect of the laws put in place providing the mechanism that would allow enrollment to occur. Percent GDP spent on education is included as a potential confounding variable in line with earlier research by Meyer and colleagues (1992) although the original study did not show the percentage of GDP expended to have an effect on enrollment rates. Additional confounding variables were also examined including the type of law implemented in the country (no effect was found). The set of confounding variables was necessarily limited and did not include many of the variables examined by the original study by Meyer and colleagues. However, even with this limited set of variables and limited number of participating countries, some insight may be gained into the use

of the CRPD as a lever for implementing effective change, and may therefore shed some light on a potential mechanism through which the original theory was expected to have effects.

After the initial STM estimation, documents most representative of a given topic were extracted. Finally, heading quotes of documents (the first 600 characters after stop words were removed) most representative of identified topics were extracted to help shed light on possible similar language between documents. In order to determine the importance of the CRPD as a guiding document, the related variables associated with the CRPD were given hypothetical values as needed. This was done because the program requires that all data entries have the same number of variables associated with them in order to run. Therefore, for the CRPD document, some of these values were hypothetical. For CWD enrollment rates, based on the expressed sentiments of the CRPD for the full participation of children with disabilities in public education, a rate of 100% was imputed. For percent GDP invested in education, an average of all included countries of the sample was used (4.8%). For parts of the CRPD signed, four was imputed (the maximum number of parts possible to agree to). All other related variables for the CRPD (years of data collection) were based on the date it was written (2006).

Once results were obtained for all of the documents in the corpus, certain cases were of particular interest based on features that differ from other documents in the corpus. For documents with features of interest (such as particularly high correlation of topics with the CRPD, or very low or very high public-school enrollment rates for CWD), case study analysis (Ragin, 1992) was conducted through a literature review using Boolean search methods of education databases for publications addressing the education of CWD available for that country/region. This literature was used to shine a light on the particular features of a document's context that might help to explain its variance from the rest of the corpus.

Chapter 3: Results

This chapter will present the findings of the STM analysis. First, an overview of the data set will be presented. Then, the results of the initial STM analysis will be shown and discussed. Finally, major findings and case examples of interest will be further investigated and discussed in terms of their alignment with the sociological theories presented in the first chapter. The subsequent discussion chapter will present potential avenues of future research in light of the findings.

Summary of the Data Set

Related variables. Related variables were imported to Stata (version 14.2) for initial description. This step allowed the researcher to provide a comparable summary table so that readers would be familiar with the types of laws included, original language, year of data for CWD enrollment rate, year of data for GDP percentage spent on education, and the number of parts of the CRPD signed. These characteristics may be of interest to readers seeking to replicate the results of this study at a future time when more standardized and comparable data become available. For the most part, these variables simply help to describe characteristics of the data set. Of the laws used for the analysis, three were constitutional amendments, ten were general education laws, and 14 addressed the education of CWD. English was the most common language for the laws included with 11 laws represented, followed by Spanish with 7, and French with two. Arabic, Greek, Italian, Japanese, Portuguese, Romanian, Thai, and Turkish were each represented by one law included in the analysis. Data for enrollment rates for CWD was obtained for the years ranging from 2004-2016, with 96.4% of the data gathered during or after the signing of the CRPD in 2006. Only one country was included with data preceding the signing of the CRPD (Chile). This was done in part due to the scarcity of available data for additional countries, and in part because the Salamanca Statement of 1994 (UNESCO, 1994) had many of the same implications as the CRPD, and Chile was a signatory at that time. Data were obtained across a relatively large time span due to a lack of an internationally comparable sample of data gathered during the same years. The sample was, nevertheless, treated as a cross-sectional analysis, with most observations falling within the specific time period of interest (post-CRPD). Data years for the percentage of GDP spent on education was similarly distributed with 96.4% of the data gathered after the CRPD was signed in 2006 and one represented country's data gathered from a source published in 2004. Data sources for CWD enrollment can be found in Appendix C. Data sources for percentage of GDP spent on education came primarily from UNESCO databases (2018) and the United Nations Development Program (2018). When data sources for GDP were country specific, these were listed with the enrollment sources as the second source in Appendix C.

The average percentage of GDP spent on education by countries included in the sample was 4.7 percent with a standard deviation of 1.5 (Figure 1) and a range from 2.6 to 9.6. The percentage of children with disabilities enrolled in public education ranged from 1.85 percent to 100 percent with an average of 72.77 percent, and a standard deviation of 27.3 percent. Most countries in the sample did not have publicly available data on the location of public educational services provided. Settings may have ranged from private home educational services to public school educational services or any other location considered appropriate in a given context for the educational benefit of children with disabilities. The lowest enrollment rate in the sample was 1.85 percent in Egypt. The highest enrollment rate in the sample was 100 percent in Luxembourg

(Figure 2). The number of parts of the CRPD signed by each country can be seen in Figure 3. The minimum parts signed was represented by Botswana with 0 (this country was included, although it was not a signatory, because it was listed in *The Handbook* and data were available for all of the related variables). The maximum parts signed (this included signing the CRPD, signing the optional protocol, ratifying the CRPD, and ratifying the optional protocol) was four.

Figure 1. Percent of Gross Domestic Product Spent on Education

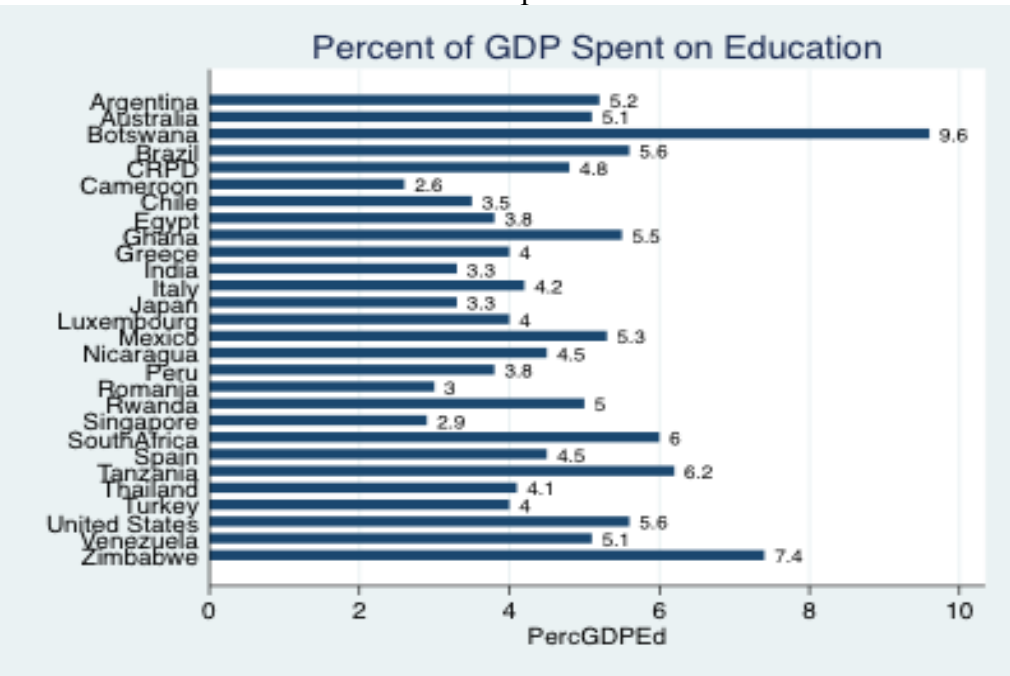

Figure 1. Data for the percent of GDP spent on education is given for the same year in which it was possible to obtain the enrollment rate percentages for children with disabilities for each of the countries in the sample. The CRPD value is simply the average of these values, used in the final STM analysis (due to an intolerance for missing data in the estimation procedures).

STM Analysis

The STM analysis was run using several different potential topic numbers to find the number of topics most understandable to human readers (based on the coherent relationship of the words to one another, and the exclusivity of the topic words distinguishing it from other topics). Topic models with 5-10 topics did not provide sufficient exclusivity, providing topic words that made it difficult for human coders to distinguish topics as unique from one another. A topic model with 20 topics was attempted but the STM program was not able to converge on an appropriate set of models with these many topics. Finally, a topic model with 17 topics was selected.

The STM program provided output for optimal topic models with this number of topics using two selection criteria. The first criteria from which the best model was selected was *semantic coherence* (defined by Minmo, et al., 2011), which is a metric serving as a reasonable substitute for human judgement of the interpretability of the topics contained in the model, and which measures the words that are most probable under a topic and therefore most likely to occur

Figure 2. Percentage of Children with Disabilities Enrolled in Public Education

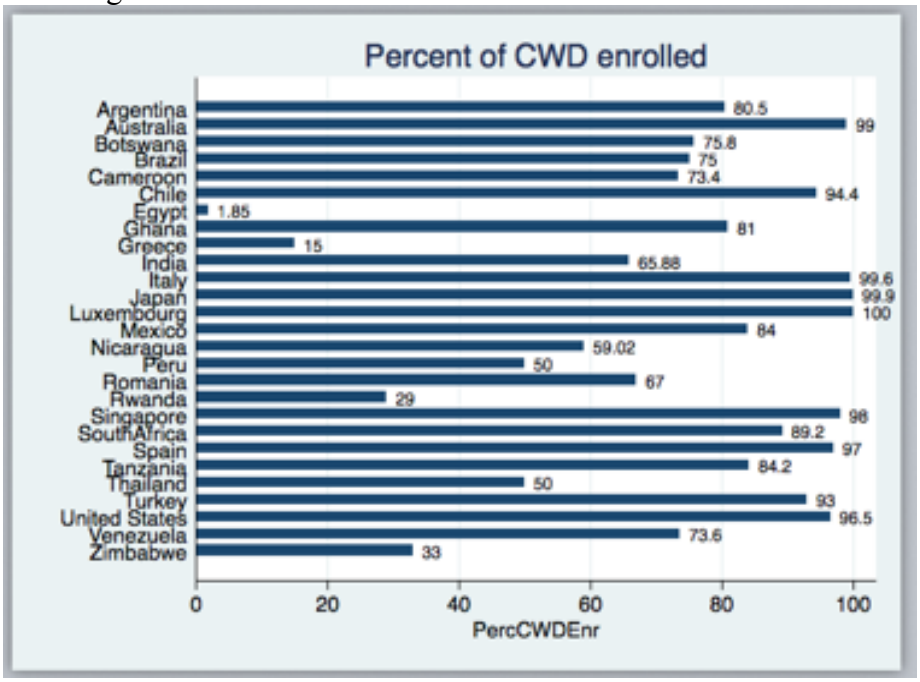

Figure 2. Sources for the enrollment rates (and years) used for these meta-data can be found in Appendix C. Currently, a centralized source for all enrollment rates is not yet available.

Figure 3. Parts of the CRPD Signed

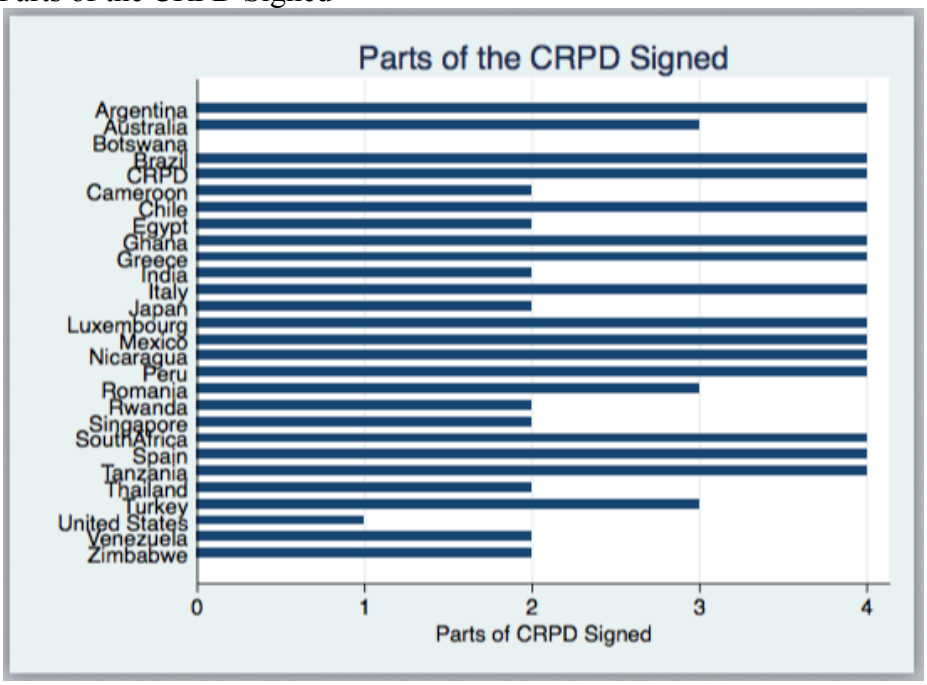

Figure 3. The maximum number of parts of the CRPD countries could agree to was four. Botswana was included in the sample due to its inclusion in *The Handbook*, although its representatives had not yet signed the CRPD at the time of this writing. The CRPD itself was inferred to have four parts signed due to intolerance for missing data in the STM program.

together within a document. *Semantic coherence* alone is not a sufficient indicator of model quality and human interpretability, as the topics selected using this criterion are likely to be few in number and primarily dominated by common words (excluding those on the stop words list). *Exclusivity* is the second criteria used by the STM package and functions to determine the best model from the ten top contending models with 17 topics. Exclusivity was proposed by Roberts and colleagues in 2014 as a measure to help with topic model selection. The measure is based on word frequency set to a threshold of .7 in favor of exclusivity (or uniqueness to that particular set of words within the topic). Of the ten models selected on these criteria, the model with the highest scores in both coherence and exclusivity was chosen for the final analysis.

Description of the corpus topics. The relative prevalence of the topics identified by the STM analysis can be seen in Figure 4. In order to understand the general content of the topics the topic label function was used to find words most highly associated with each topic. Then, the researcher and a colleague independently labeled the general topic with a shortened description based on the most frequent terms associated with that topic, as well as by using terms that were exclusive to that topic, thereby differentiating it from the other topics in the set. The most prevalent topic in the set was topic 9, which was determined to be related to the *rights of people with disabilities*. The most frequent words in this topic included "disability, person, shall, state, right, access, include, and participate." The most exclusive words unique to this topic included, "participate, disability, enjoy, access, basic." Topic 8 appeared to be about the *provision of educational services,* and included such words as "shall, school, may, provid, and state." Topic 6, topic 12, and topic 13 appeared to be primarily *procedural* words, for example "may, govern, shall, subsect, author, and clause." Topic 17 appeared to be related to *inclusion* of people with disabilities in a variety of ways, containing the words, "school, social, public, integrate, work, rehabilitate, support, within, and provide." A shortened set of the output for the words associated with each topic and the manually determined titles for each topic may be found in Appendix D.

A further description of the topics' relationship to one another in the corpus can be seen in Figure 5, where topic 10 can be seen as a central hub connecting most of the other topics. This topic was associated with *education*, including words such as "teacher, nation, student, teach, closely with topic 7, or the topic describing *teacher training*. More details about these topic contents may be found in Appendix D. However, these two topics do seem to share some characteristics. Both topics mention participation, use the word "ensure" (presumably related to access to services), use the word "promote" (again, presumably related to rights or access to services), and both topics use the stemmed word "organ" (likely versions of the word "organization" or "organizing").

Several topics can be seen grouped together near the central education node (topic 10). These are topic 14, identified as *evaluation of student needs*, topic 12, coded as a *procedural* topic, topic 4, coded as *requirements for teachers of students with disabilities*, and topic 15, coded as *funding structure*. Ostensibly, the reason these topics are centrally located and connected to one another is that they are all important aspects of the central topic of education and are likely to be found together in documents in the corpus. A closer examination of the table in Appendix D shows that topics 14, 12, and 4 all share the words "school" and "student" and that topics 4 and 15 share the word "special." These frequently occurring words across these four topics are likely what pulls them towards the central topic 10 of *education*.

Figure 4. Topic Proportions for the Corpus

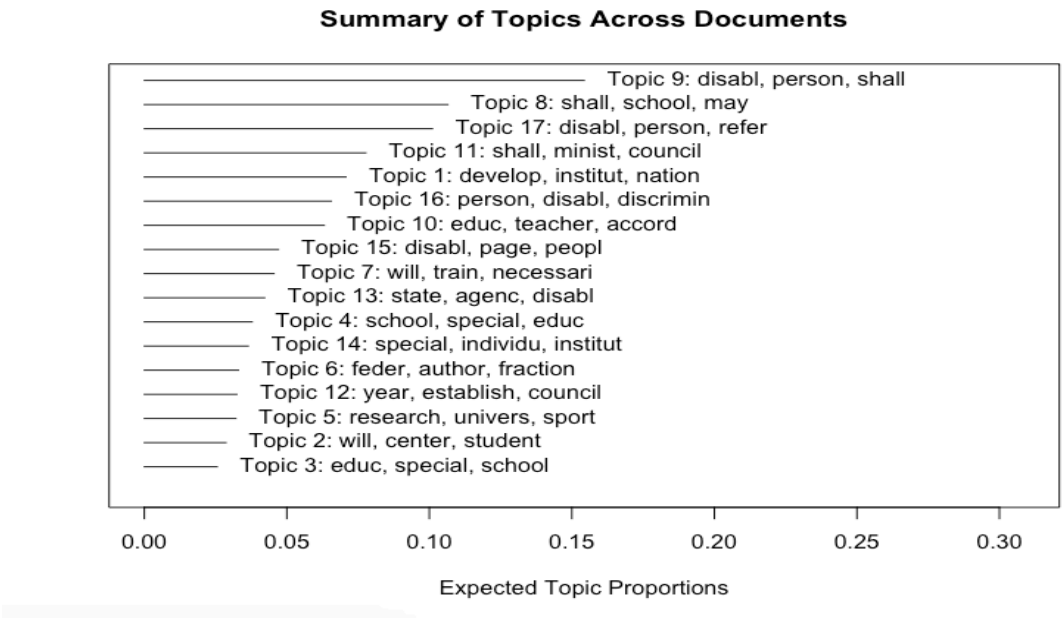

Figure 4. The most prevalent topic was topic 9, which appeared to be about the *rights of people with disabilities*. Topic eight was next most prevalent, and appeared to be about the *provision of education/school access*. Topic 17 appeared to be about the *inclusion of CWD*. Topic 11 was manually labeled as *the structure of education for CWD*. Topic 1 appeared to relate to the *establishment of public education for CWD*. Topic 16 was determined to relate to *prohibition of discrimination*. Topic 10 related to *education of CWD*. Topic 15 seemed to relate to *funding structures*. Topic 7 seemed to relate to *teacher training*. Topic 13 seemed to be *procedural.* Topic 4 seemed to be about *requirements for teachers of students with disabilities*. Topic 14 seemed to be about *evaluation of student needs*. Topic 6 was primarily *legal procedural* language. Topic 12 was *procedural* language. Topic 5 established *related program access for CWD.* Topic 2 seemed to relate to the *public availability of laws governing education of CWD*. Topic 3 appeared to relate to the *regional structure of education for CWD.* Expanded descriptions of topics and labels may be found in Appendix D.

For the most prominent topic in the set, topic 9, hereafter referred to as the *rights of people with disabilities* topic, the STM plotquote function was used to determine which documents were most representative of this topic. Plotquote was specified to return the first 600 characters of the top three documents associated with this topic. The relevant output may be seen in Figure 6. This function does not return the whole document, but rather the first 600 characters at the beginning of the document (including spaces). Therefore, the documents were identified through matching these titles and early passages to the original (or translated) whole documents included in the corpus. The documents most representative of this topic in order of presentation in the table are; the CRPD, Rwanda's Law no. 1/2007, and Egypt's Constitutional Amendments 80 and 81. Rwanda and Egypt have some of the lowest documented enrollment rates of CWD in public education. Therefore, later in this chapter, these countries will be included in the case

study information for further analysis of why these laws that most closely imitate the primary topic of the CRPD are not effectively promoting inclusive educational practices at scale.

Figure 5. Topic Relationships in the Corpus

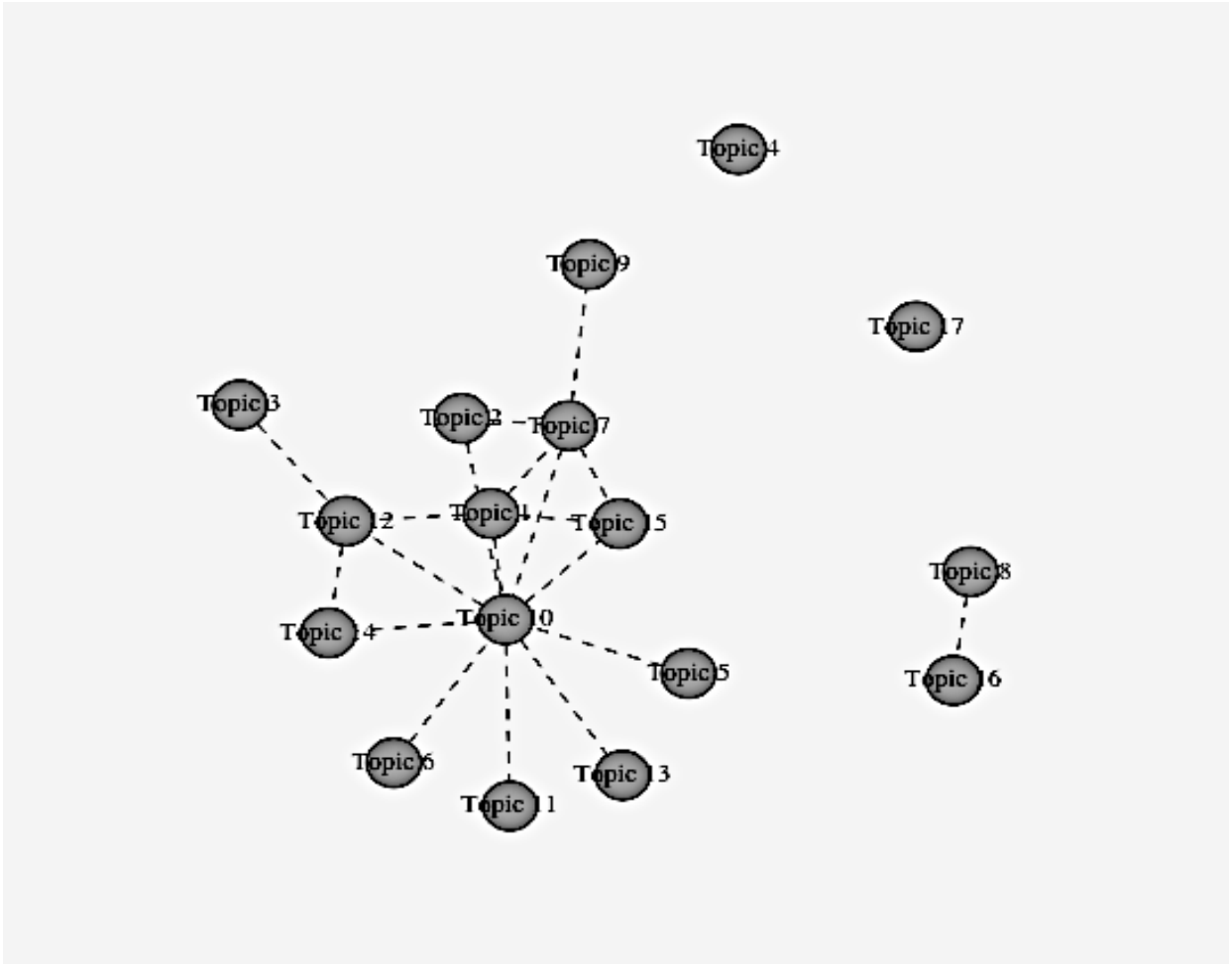

Figure 5. Topic ten (*education*) can be seen as a central theme connecting many of the topics in the corpus.

Certain topics tended to be associated with higher enrollment. This included topic 11, the words of which seemed associated with the structure of education for CWD (including "service, consult, provide, public" and listings of individual committees and people responsible for service provision). Topic 11 was best represented by South Africa's National Education Policy Act of 1996, Ghana's Education Act of 2008, and Tanzania's Persons with Disabilities Act of 2010. A visual representation of this topic's prevalence and the associated meta-data of enrollment for CWD can be seen in Figure 7. This figure was created using the estimate effect function in the STM package. This function creates a regression where topic proportions are the outcome variable, and the related variable of interest (here enrollment rates for CWD) is used as a document characteristic predicting the topic prevalence. This creates an estimate of the topic proportion within each document and averages this across the corpus. Note that the graph includes topic proportion values less than zero. This is because the package uses a normal distribution rather than one constrained to fall between zero and one. The topic prevalence is determined by the model's fit and thus does not have a well-defined statistical distribution.

Regression tables associated with these graphs are not particularly interpretable for this reason. The package's authors (through the R documentation for the estimateEffect function) recommend using the graphic figures to provide more insightful interpretations of the output. Documents associated with 80% enrollment or higher tended to include higher proportions of this topic. However, as can be seen in Figure 7, the error bars around the expected topic proportion include zero, so this finding is not statistically significant. Similarly, although topics 4, 13, and 14 were associated with higher enrollment for CWD, the expected topic proportion included zero. For topic 16, a slight positive deviation from zero in the margin of error can be seen in documents associated with an enrollment rate around 100%. This can be seen in Figure 8. Many of the results contained in the analysis hinted at relationships that were not statistically significant (error bars of the confidence intervals included zero, or no significance, as a possible predicted outcome), which is likely due to the small sample size (n = 27) included in the final corpus. Rerunning the analysis when data become more readily available across a wider range of countries may prove more enlightening in years to come. For example, topic 11, related to the *structure of education for CWD*, seems to be related to CWD enrollment in public school (80% or higher) when this topic represents about 40% of the document proportion, as seen in Figure 7. However, this result is not statistically significant as the confidence interval includes zero.

Figure 6. Results from the Plotquote Function for *Rights of People with Disabilities*

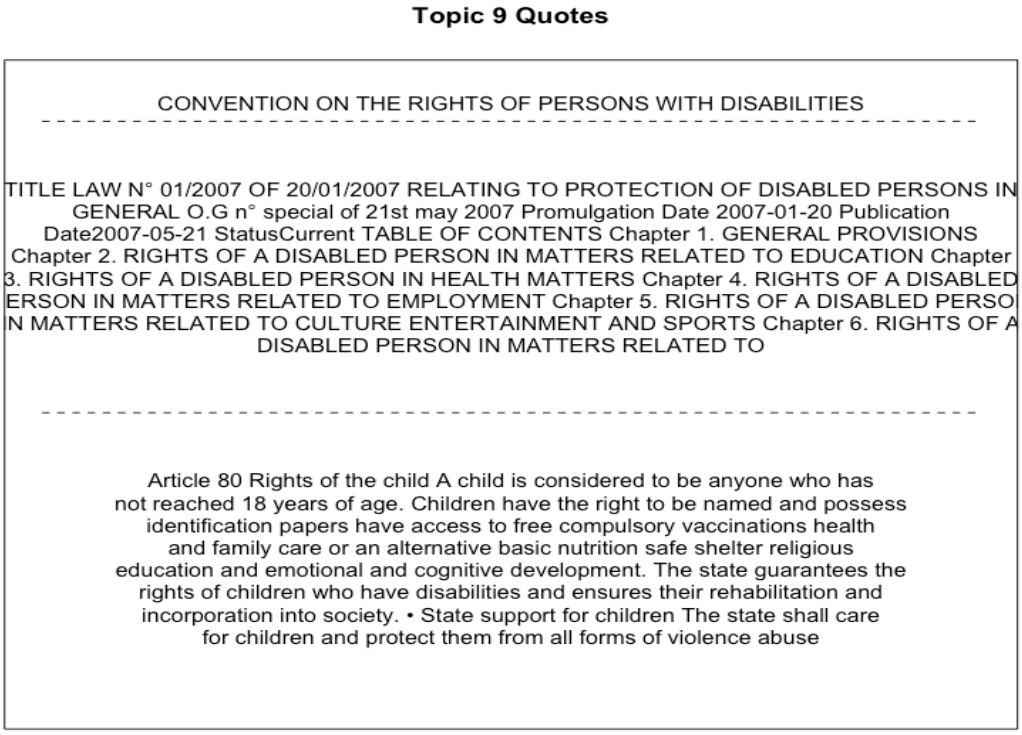

Figure 6. The plotquote function printed the first 600 characters of the documents associated with a given topic including spaces. These results were from topic 9, *the rights of people with disabilities,* the most prominent topic in the set. The documents are (from top to bottom) the CRPD, Rwanda's Law No. 01 on Special Education, and Egypt's Constitutional Articles 80 and 81.

Topic 16 seemed to be primarily related to *protection from discrimination*. The topic included such words as "person, disability, discrimination, unlawful, required." Documents that were most representative of this topic included Australia's Disability Discrimination Act of 1992, Botswana's National Policy on the Integration of Persons with Disabilities, and Singapore's Compulsory Education Act (revised, 2018). These countries do exhibit relatively high enrollment rates for CWD (Australia = 99%, Botswana = 75.8%, and Singapore = 98%). Of this group, Australia will be further described in a case study later in this chapter. The results for this topic were more indicative of higher enrollment rates for CWD than for any other topic in the corpus. Documents with topic proportions for protection from discrimination that were nearly half composed of words related to this topic tended to have enrollment rates near 100% for CWD in public schools.

Is Alignment with the CRPD Associated with Higher Enrollment Rates for CWD?

In summary, the CRPD was most represented by topic 9, *the rights of persons with disabilities*. However, laws that were most closely aligned with this topic had some of the lowest public-school enrollment rates for CWD in the sample. The correlation between topic 9 and CWD enrollment rates, was not significantly different from zero in this sample. This may be seen in Figure 9, below. This answers the second research question regarding to what extent alignment with the topics of the CRPD predicts measurable outcomes for children with disabilities in terms of access to public education. Case studies of the countries that demonstrated the most alignment to this topic may shed further light on why these laws seem to be aspirational rather than effective within the contexts of their respective countries.

Figure 7. Topic 11 Correlation to Enrollment of CWD

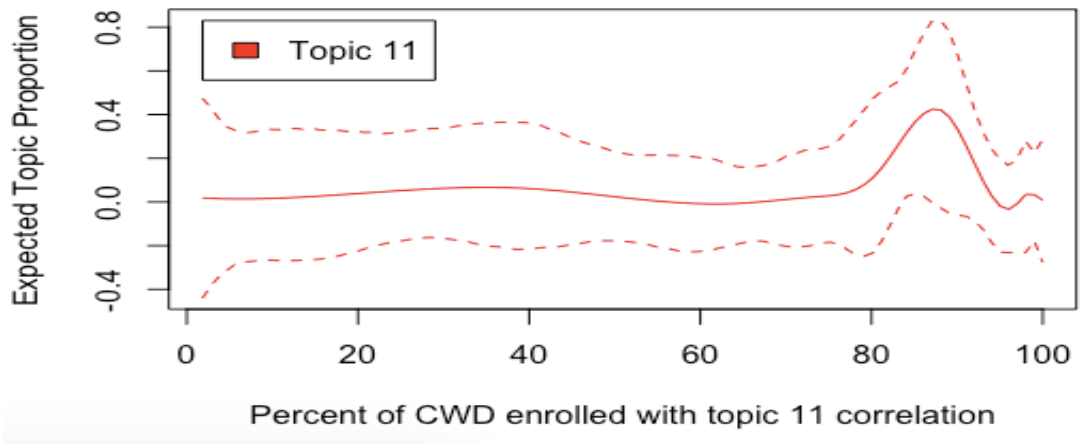

Figure 7. Topic 11, the *structure of education for CWD*, was associated with higher levels of public-school enrollment for CWD (around 80%). However, the confidence interval includes zero. This was the case for several topics and may be related to the small number of countries represented in the sample.

Figure 8. Topic 16, *Protection from Discrimination*, Correlation to Enrollment of CWD

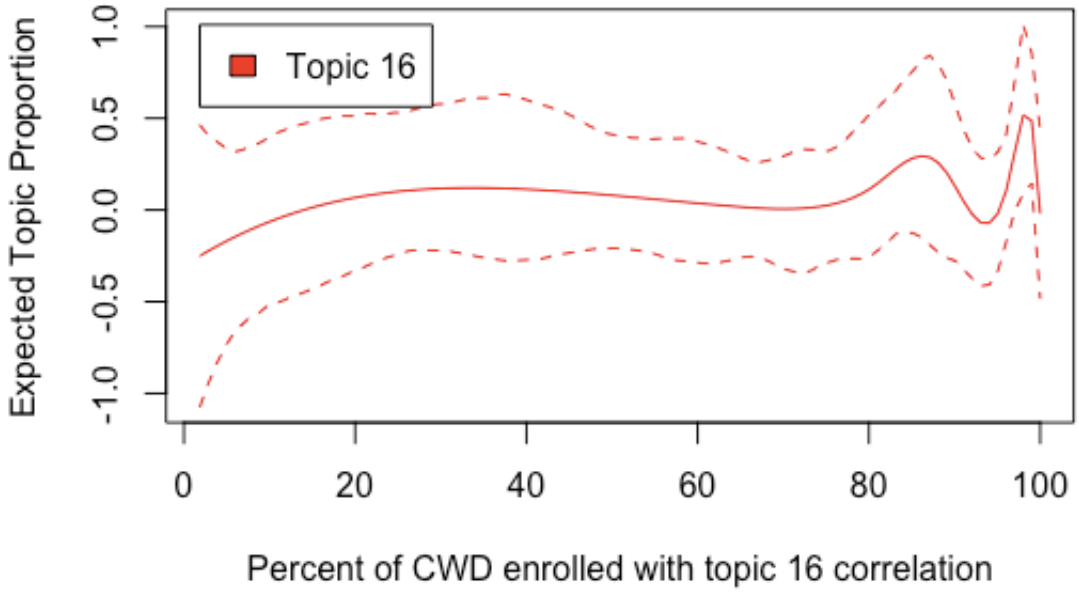

Figure 8. Topic 16, *protection from discrimination* was associated with enrollment rates for CWD around 100%.

Figure 9. Topic 9 Correlation with Public School Enrollment for CWD

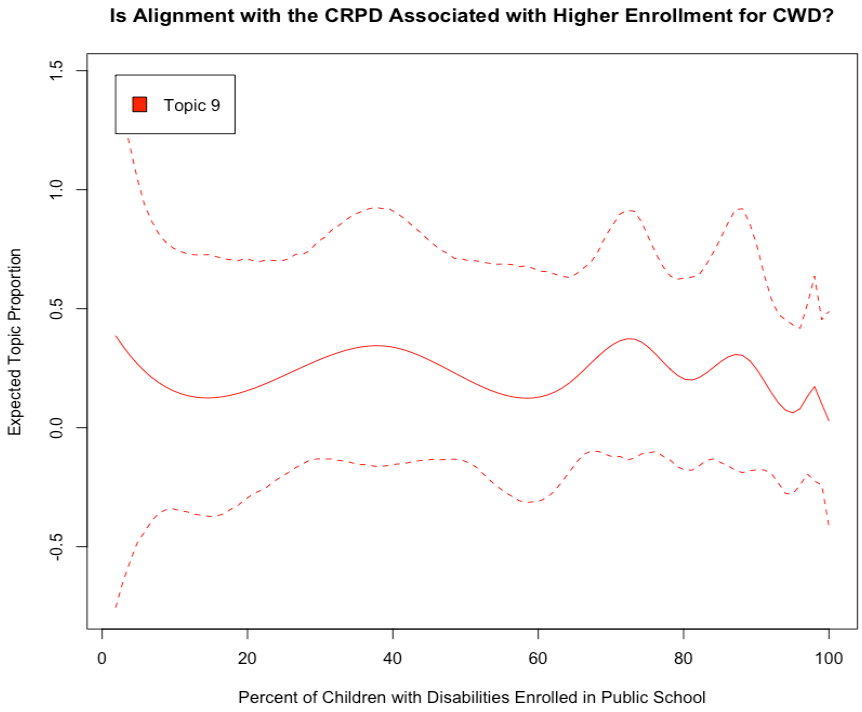

Figure 9. Alignment to topic 9, *the rights of persons with disabilities*, does not predict public school enrollment for CWD.

A further question, given the metadata variables that were included in the analysis, was whether alignment with the CRPD was associated with the percent of GDP spent on public education. However, unsurprisingly, this was also not the case, as can be seen in Figure 10. The reason this result was not surprising is that Meyer and colleagues found no such connection in their original research, which included even more information about spending (such as the amount of aid received by that country). This makes sense in that although some developing countries may pour a large percentage of their GDP into education, this amount is vastly eclipsed by a much smaller percentage of GDP spent by more developed countries. Many countries with fewer resources actually spend significantly higher percentages of their GDP on education than do countries traditionally considered to be "developed." These data can be seen in the initial descriptive tables in the section on related variables. It may be helpful to note that the data sources used for this project, for the most part, do not disaggregate the education spending of the country by grade level or for higher education. Some data was retrieved from a database that does do so (in which case the GDP percentage is based on K-12 spending), but other data was retrieved from governmental or UNESCO reports. Readers interested in the data sources may refer to Appendix C for further information.

Figure 10. Correlation Between Topic 9 and Percent GDP Spent on Education

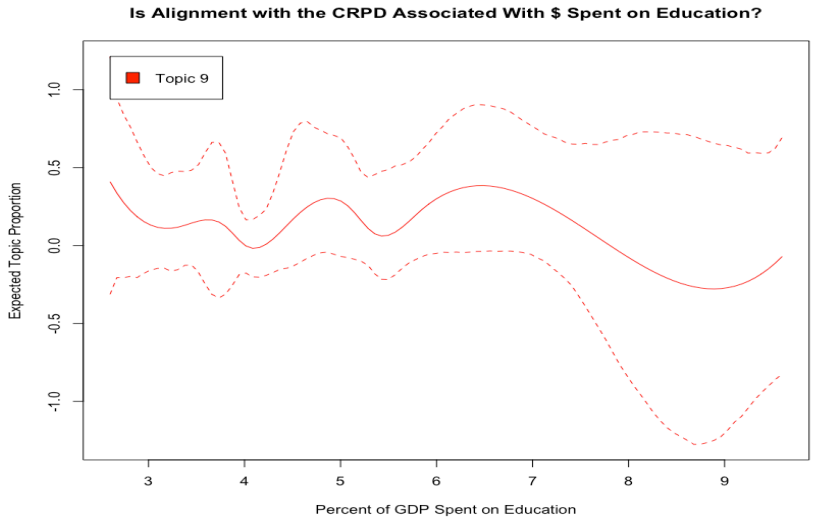

Figure 10. Topic alignment with the CRPD was not associated with the percentage of GDP spent on education.

The next section will describe country specific variables and contexts that may help to explain why some laws demonstrate alignment with the CRPD without demonstrating measurable outcomes in terms of education for CWD. Additionally, a case study looking at the example of a country with high enrollment that was highly associated with topic 16, *protection from discrimination*, will be examined.

Case Studies

In order to review the available literature that may help to explain outcomes in the chosen case study countries, a systematic Boolean search procedure was used including the words "special education" and the name of the country in question in Education Full Text, Web of Science, and Google Scholar from years 2005-2019. Searches on Google Scholar typically yielded over 50,000 articles, books, and dissertations sorted by relevance. These were addressed

consecutively and once 10 irrelevant articles in a row were observed, the literature review of Google Scholar sources ceased. Dissertations were excluded from consideration. However, an additional search was conducted for peer-reviewed articles by dissertation authors who had published reviewed articles on relevant topics. Additionally, a manual search was conducted of relevant articles cited in the references sections of articles identified on these databases. Eligibility criteria for inclusion for review consideration included (1) the study, policy brief, or literature review was conducted in the country of interest, (2) the study included an explicit discussion of the educational situation of children with disabilities (aged 5-18), (3) the study gave specific information about the circumstances of CWD in relation to public school access in the region, and (4) the study was conducted from 2005-2019. Single-case design studies that offered no generalizations or descriptions of the school system beyond the small sample of research participants were excluded.

In total two studies for Rwanda, 6 studies for Egypt, and 7 studies for Australia were used to inform the following summaries of salient factors related to publicly funded education for CWD. In the case of Australia, so many articles about "special education" in the country were available (well over 500 on a single database for the time frame specified) that a further criterion of *data saturation* (Saunders, et al., 2018) was used to conclude the review of articles obtained. Saunders and colleagues defined data saturation as reaching a point in research at which further review of data has no additional relevance to the research question, or a point at which informational redundancy is reached. A brief description of the studies used may be found in Table 7 in Appendix F.

Rwanda

Only two articles that fit the search criteria were identified for Rwanda. Both articles have as their first author the same author of the chapter in *The Handbook* (Karangwa, 2017). Rwanda has been portrayed in Western media primarily in the context of the 1994 genocide within the country, resulting in the deaths of one sixth of the population. Many articles written about the country address educational needs in the immediate aftermath of this event. More recent articles regarding the education of CWD in the country after 2006 were limited.

Both articles describe barriers and potential facilitators for the inclusion of children with disabilities in public education in Rwanda. Karangwa, Ghesquiere, and Devlieger (2007) describe the population of the country as suffering from extreme resource constraints, but benefitting from strong communities of support. Further, the authors note that rehabilitative and education services are provided primarily by church-linked charitable organizations, which account for approximately 90% of the available resources for persons with disabilities in the country. The majority of people with disabilities live in rural areas (94%) with their immediate or extended families, 90% of whom live in extreme poverty. Illiteracy rates are high in the country (43-51%), and the basic needs of many residents for sanitary water and health services are not met, resulting in a life expectancy of 48.5 years. The authors identify three types of barriers to school access for children with disabilities: institutional discrimination (lack of legal protection and provisions), physical barriers to access, and attitudes of discrimination based on cultural practices.

Rwanda provides 6 years of free primary education, after which families must pay in order for children to attend school (Karangwa, Miles, & Lewis, 2010). Even so, many families cannot afford to purchase uniforms or other materials required for attendance, even when school tuition is paid by the government. The authors noted that many children worked to help to support their families rather than attending school. For those in rural communities, distance from

school was also a barrier, as well as the inaccessibility of school buildings for children with physical or sensory disabilities. Karangwa and colleagues (2010) estimate there are 175,205 children with disabilities in Rwanda, 800 of whom attend one of the countries 34 schools for CWD (less than 1%). In the same study, teachers who were interviewed expressed an awareness of the benefits of placing CWD in general education classrooms. However, the teachers also noted a lack of clean water, poor desks, building structures, and class sizes averaging 56 pupils as major barriers. Further, the authors noted that the words for people with disabilities in the local language are dehumanizing (for example "karagi," meaning "small speechless thing" for a child who is deaf). The common term for a child with an intellectual disability is best translated as "mentally sick child." The author draws a parallel between the dehumanizing terms used for those with disabilities and the language used to refer to the minority Tutsi ethnic group during the genocide as "vermin" or "cockroaches."

Egypt

Of the six studies identified that described the education of students with disabilities in Egypt, only one study included parents in the sample, and no studies included children. The studies identified either reviewed the existent literature in the region (Alkhateeb, Hadidi, & Alkhateeb, 2015) or were conducted with pre-service teachers or current teachers in the country. A brief description of each study may be found in Appendix F.

The Handbook (2017), references several facts that may help to shed light on the lower enrollment rates of CWD in Egypt. The author of the chapter on Egypt (Habib, 2017) reports that the highest illiteracy rates in the country are in the Upper Egyptian governates including Minya (36.7%), Beni Suef (34%), Fayoum (34.7%) Sohag (34%) Assuit (31.7%), and Qena (30.3%). The author also notes that illiteracy rates in rural areas are higher (31.2%) than in urban ones (18%). There are 903 schools for CWD out of a total of 43,854 public education schools representing 2% of the public education schools available to children in Egypt (p. 303) and not including the parallel system of religious schools.

Legal precedents. The educational services for CWD in Egypt are governed by the Egyptian Constitutional Amendments 80 and 81, according to *The Handbook* (2014, see Appendix E for a list of relevant laws used in the corpus). These amendments together are 332 words in length when translated to English from the original Arabic. Amendment 80 specifies the rights of children in general including the rights to vaccinations and health care, basic nutrition, shelter, and education.

Several articles reviewed also described Ministerial Decrees in effect. Ministerial Decree No. 252/2017 is described as providing guidance for the integration of students with emotional and behavioral problems, medical problems, and learning disabilities in public schools (Ali, 2018). Additionally, Ministerial Decree No. 42 (2008) is cited as providing guidance on the integration of students with mild disabilities in schools that are prepared to receive them (Ali, 2018). The author describes this decree as being updated in 2015 to specify students with certain disability labels who would be permitted to attend school (including those with vision impairment, hearing impairment, mobility and physical disabilities including moderate cerebral palsy, and mild "mental disabilities" including slow learning and autism, Ali, 2018). This law does not allow children with more significant impairments to attend school (Habib, 2017, p. 307).

After translating the decree via Google Translate, this was confirmed, in that this decree provides for students with "minor disabilities" to attend public schools, not including students with an IQ under 65. The decree is six pages long in Arabic and also 6 pages long in English.

Based on the translation, it seems that little information or elaboration is provided on how the decree may be implemented or what types of supports may be offered to teachers attempting to plan for students with disabilities in their classrooms. However, the translation of this decree to English is unclear and there may be further information contained in the decree not described elsewhere in the literature review. The three-page plan for training to meet the professional needs of teachers of CWD, contained in the Ministry's General Director of Special Education section of the government website, was not translatable using Google Translate methods.

Teacher attitudes and training. Surveys were conducted in most of the studies reviewed with pre-service or in-service teachers. Most teachers had not received any training in supporting students with special needs or did not feel prepared to deliver such support (Ali, 2018; Abdelhameed, 2015; El-Ashry, 2009). Some teachers in the studies received professional development activities sponsored by the Ministry of Education. Professional development participation was reported by 16.5% of the teachers in the Ali (2018) study. The Wormnaes (2008) study was conducted with teachers participating in a cross-cultural professional development training on inclusive practices used in Norway (sponsored by a parent advocacy group). However, across most studies, teachers expressed a lack of preparation within their credential coursework that would allow them to make their classrooms accessible or appropriate to students with disabilities.

Limitations for this case study. The studies reviewed tended to focus specifically on inclusion of CWD in general education classrooms, rather than on provision of educational services to CWD in any publicly funded setting (which is the focus of this paper). Parents who were surveyed expressed a lack of confidence in inclusive settings and did not see any benefit of including their children with general education peers (Abdelhameed, 2015). However, none of the studies asked parents what types of education their children were receiving (if not inclusive) and whether those educational opportunities were worthwhile for their children. Therefore, it is difficult to determine from the existing literature what types of educational opportunities exist in Egypt for children with disabilities and/or why they may not be attending publicly-funded schools.

Australia

According to *The Handbook*, Australian schools are governed by independent departments of education for each state or territory (8 in total). The graduation rate for the country is approximately 75% with a lower rate (45%) for students from the indigenous population. Most students attend public school (65%), but there is a large sector of private schools. Religious schools, though considered private, are typically affordable for families. Funding is provided by the federal government for the education of students with disabilities and includes block funding (covering most students with disabilities) and targeted funding (for those with the highest support needs). Universal screening is conducted by each state or territory one year prior to mandatory school enrollment, and as needed by school psychologists when a student is suspected of having a disability.

Legislation. *The Handbook* cites the Disability Discrimination Act (1992) as the primary federal law mandating education for children with disabilities (and thus the law used for this study). This law was further strengthened in 2005 by the Disability Standards for Education which provided more information about how education for CWD was to be provided within the states and territories. These standards are revised every 5 years to update educators and to provide guidance on the provision of services for students with disabilities. The 2005 document is 46 pages long and publicly posted on the governmental website. The standards further describe

enrollment, participation, curriculum development, harassment prevention guidelines, and exceptions for students with disabilities. Public education is mandated for students with disabilities from ages 5 to 17, and often includes supplementary early education services.

Factors contributing to public education for CWD. Several authors describe factors that benefit children with disabilities in the public education system in Australia. Van Kraayenoord (2012) describes teaching practices including the use of differentiated instruction and lessons based on the principals of Universal Design for Learning that support not only children with disabilities, but those from diverse cultural and language backgrounds participating in the schools. Subban and Sharma (2006) found that most teachers in primary schools in Victoria had experience teaching students with disabilities (94%). In the same article, the authors found that teachers with specialized training for supporting students with disabilities were more likely to hold positive attitudes about including these students in their classes. Additionally, knowledge of the relevant laws governing the education of CWD correlated with primary school teachers holding positive attitudes about inclusion. In a later study, Sharma (2014) found that in New South Wales requirements for specialized coursework were being embedded in regular teacher preparation courses in order to obtain valid teaching credentials, which may help to spread capacity for supporting students with disabilities in regular classrooms. Also, in New South Wales, Graham and Spandagou (2011) found that principals of more diverse schools (including students who have refugee status and Aboriginal students) defined inclusion broadly as encompassing social, economic, cultural, ability, and ethnic differences. Principals in such diverse schools seemed more committed to the idea of "being inclusive" than principals in schools serving primarily white, middle-class students.

All of the studies regarding the education of CWD identified for review in Australia focused on inclusive education (i.e., placement of CWD in general education classrooms) rather than simply on public education provision. This seems to coincide with the legal mandates for placement in regular schools and classrooms when possible. Additionally, the 2010 census data in Australia includes educational placement information, citing that 65.9% of CWD attended regular public schools, 24.3% attended a class for CWD in a regular school, and 9.9% attended a school for CWD (Sharma, 2014). Further data is also available disaggregated by disability label and state or territory in which the student receives educational services. Additionally, the legislation around the provision of education for CWD in Australia provides means for parents to determine the educational placement of their child and have significant input in the development of their individualized education plan. The Australian Commonwealth Schools Commission of 1981 provided for the guaranteed funding of public education for all children, including those with severe disabilities, further basing this funding on the child's need for educational support across several domains including: language skills, social competence, self-care, mobility, and curriculum needs (Sharma, 2014).

Challenges. Several articles included for this review cited challenges confronting various stakeholders in the Australian education system. *The Handbook* describes challenges including structural challenges in appropriately preparing teachers to support students with disabilities and promoting connection in services across the lifespan. The need for adequate teacher preparation is also described by parents responding to questionnaires and interviews in rural New South Wales (Tiat & Hussain, 2017). The same parents also described difficulties caused by a lack of public transportation and long distances to travel for services when living in rural areas of New South Wales. In Victoria, only 39% of primary school teachers reported having prior training to help them provide appropriate educational supports for students with disabilities (Subban &

Sharma, 2006). In the same study, teachers also expressed concern regarding students with disabilities receiving adequate funding and adult support to allow them to participate in inclusive settings. In a later article, Sharma (2014) added that the lack of tangible incentives for attaining specialized training to serve CWD may also be a barrier to more teachers pursuing this line of study. Similarly, principals in New South Wales expressed concern regarding some students' needs for more adult as well as financial support, and described their attempts to have students diagnosed with disabilities that would provide such support in the absence of capacity building for qualified teachers (Graham & Spandagou, 2011). Some principals in the same study also viewed their legal responsibilities to CWD as a burden imposed by the government rather than as a human right.

Chapter 4: Discussion

The results of the study do not entirely answer the original research questions. Though it was possible to use the structural topic model to describe topical features of the legislation governing the provision of educational services for CWD, a larger corpus might reveal more interesting trends in the data. Of particular note was that the most prevalent topic extracted by the STM package was the *rights of PWD,* which was represented by the CRPD. This indicates that the CRPD does serve as a kind of model for the corpus. Additionally, this fits the conception of Meyer and colleagues (1992) that the rights of the individual as a sign of national progress are demonstrated through the provision of public education. However, in regards to the second research question, whether alignment to the language of the CRPD predicts public school enrollment for CWD, the answer was clearly negative. This could be seen in the result indicating that two of the countries with laws most aligned to the topic represented by the CRPD had some of the lowest enrollment rates in the sample. Egypt and Rwanda also had relatively little organizational elaboration in the laws governing provision of public education services for CWD, indicating that while the current laws broadly mimic the CRPD, the details allowing for implementation on the ground has not yet been realized in these contexts. Of further interest was the incidental finding that the topic *protection from discrimination* was associated with enrollment levels for CWD nearing 100%. However, due to the small sample size, no robust findings could be determined. These findings hint at further possible insights that might be obtainable using these methods once a larger corpus and related variable dataset becomes available.

Implications

World society theory. In terms of Meyer and colleagues' (1992) model, there may be several reasons why public education for CWD is not occurring at the same rate in some contexts as it is in others, despite alignment of the topics of legal documents to the CRPD. The authors described mass schooling as a model in which progress is signaled and links individuals to their nation states. In societies in which "personhood" of certain individuals is not entirely embodied in the language and practices of the culture, perhaps the education of CWD is not considered to signal the progress of the nation state. Language around disability that causes a person to be referred to as an object (in the case of Rwanda) may be indicative that the group CWD represent are not fully considered to be citizens capable of contributing to their country's progress. Similarly, the explicit exclusion of CWD carrying a certain diagnosis in Egypt may indicate a lack of recognition of these children's potential to contribute to their country's progress. In addition, the lack of internationally comparable data with internationally agreed upon definitions of disability make drawing empirical conclusions about the applications of world society theory difficult at this time. The corpus is also relatively small for finding statistically significant differences between countries legal documents and enrollment rates. Accessibility of these documents and data may improve over time, altering the insubstantial findings of this exploratory study.

However, the model also stipulates a minimum threshold of 10% enrollment to indicate that nations had acquired the arrangements of a mass education system. This is a threshold Rwanda has met at 29% enrollment. There is a distinct possibility that in the case of Rwanda, educational opportunities for CWD are actually rapidly improving. Karangwe, Miles, and Lewis (2010) estimated an enrollment rate of less than 1% primarily through religious educational organizations in 2010. But UNICEF (2014) reported an enrollment rate for CWD in public education at 29%. Therefore, either the data are quite unreliable, or access to educational

opportunities for CWD is expanding rapidly in this context. With limited sources reporting this data, determining which is the case is quite difficult. Even less clear is why Egypt has not met this threshold at 1.85% enrollment for CWD (Center for Economic and Social Rights, 2014), given the spread of mass public education in the country. The difficulty of obtaining comparable enrollment data for CWD may hold part of the answer to this question. One significant difference between Meyer and colleagues' work and the current study, is the lack of internationally comparable data for (a) a larger sample of countries and (b) with a shared definition of "disability." The original world society work would not have had these issues due to the universally agreed upon definition of "childhood" for education purposes, and reporting requirements to an international database with data from the same years for analysis. The normative value of publicly available data will be described in the next section.

Neoinstitutionalism. As described in chapter one, neoinstitutionalism is a framework through which to explain isomorphism, or how one organization or institution comes to resemble another. DiMaggio and Powell (1983) described three processes by which this similarity occurs: coercion, mimesis, and normative means. In Meyer's and colleagues (1992) formulation of world society theory, coercion is not a driver of conformity to public education models. In the current study mimesis seems to play a clear role in the national laws governing special education. This provides a potential mechanism through which isomorphism occurs, and therefore elaborates on one of the paths through which societies follow the world model. This can be seen through the identification of the most prominent topic across all documents, represented by the *disability rights* topic, which was the topic was most clearly embodied by the CRPD. Either the laws influenced the formulation of the CRPD which now resembles them, or the CRPD influenced the formulation of the laws that came after its creation, or both. In either direction, mimesis plays a part.

Normative effects may play a part in increasing enrollment for CWD in countries where conformity (or absence of conformity) to the principles of the CRDP is visible. This may be particularly true of countries where the data on public school enrollment, graduation rates, standardized test score data, and types of educational placements are highly scrutinized by advocacy groups, the public, and the international community. For example, in Australia and the United States data on the educational placement of CWD is highly discussed in research literature, through disability rights organizations, and in public reports. For countries where data is difficult to obtain, the pressure of normative values may not be as noticeable. In Rwanda and Egypt, there is relatively little scholarly discourse regarding CWD and their educational opportunities. Without reliable data as well as the pressure of advocacy groups, researchers, and the public it may be more difficult for CWD and their allies to promote more equitable access to educational resources.

Institutional logics. Based on the topics obtained from the STM analysis, institutional logics seem to play some part in the development of legislation governing the provision of services to CWD. The types of language most associated with higher enrollment rates were in topic 16, or *protection from discrimination*. Words associated with this topic appeared to be related to employment and reasons for requiring protection from discrimination for people with disabilities. Further examination of the laws associated with this topic (and therefore with higher enrollment for CWD) including the laws from Australia, Botswana, and Singapore may be warranted.

To some extent the laws associated with higher enrollment do appear to be aligned with the inclusion or social logic. These laws include language around protection from discrimination,

the rights of people with disabilities, and supports required for participation in society, including access to employment. In the case of Egypt, the explicit exclusion of children with disabilities who have an IQ of less than 65 or significant motor difficulties does seem to align with a medical model in which these children are considered somehow unprepared to learn until their disability category changes. The lack of person-first language constructions in describing people with disabilities in Rwanda might also be considered to fit a medical model in that the disability itself is given priority in describing an individual rather than a more humanizing personal descriptor. However, further analysis would need to be conducted to fully examine whether these trends are consistent given the limited data and research available from these contexts.

Limitations

Several limitations impact the use of this study for predictive purposes. The analysis uses a relatively small sample size ($n = 27$) and is correlational rather than causal in design. The sample may also not be representative given that it was entirely dependent on the content of *The* Handbook, and only included countries for which data were obtainable online. The data obtained are cross-sectional rather than longitudinal, providing a snapshot of policies and outcomes rather than showing trends over time. Not all data were from comparable years. Additionally, maximum values were imputed for the CRPD for enrollment rates (without imputed values the program would not have run), which may have had an effect on the data as there were few countries represented with such high values for enrollment. The study also likely does not include several mediating factors that may be influencing the data (for example: crisis events in various countries, income disparity, a measure for level of totalitarianism, or a measure for how difficult or easy it is for families to access legal systems for redress of grievances). The scope of the research questions was relatively limited to the content of legislation as a potential influence on enrollment rates.

Conclusion

Hagiwara and colleagues (2019) recently described the special education research literature in English and Spanish speaking countries in terms of available interventions for students with special needs attending public schools with their general education peers. They found that there have been more intervention studies conducted in the United States than in other English-language countries, and that there was an emphasis in this research on inclusion of students with disabilities with their same-aged general education peers. The authors suggest that there have been three waves of inclusion in the United States (first posited by Turnbull, Turnbull, Wehmeyer, and Shogren, 2016). The first wave focused on providing access to general education settings for CWD. The second wave of research described ways to provide access to participation in those settings for CWD. The third wave is emerging and has focused on promoting CWD's access to general education curricula through adaptations, modifications, and individualized supports. For the Spanish-language studies included in the review, there seemed to be a "relative newness" of consideration for the educational needs of CWD given the ongoing segregation of CWD in these contexts.

The issue of inclusion in public education for CWD is one that has likely been unexamined in some contexts. The CRPD may provide an impetus for researchers and activists in those contexts to further the protections and entitlements for CWD, but such a process may take a longer period of time than the institution of public education for children without disabilities. Potentially, education for CWD might be adopted more slowly because it (a) affects a smaller subset of the population than public education for all children, (b) may not be adopted until the public education system is efficiently educating the majority of children in a context,

and (c) may rely more heavily on parent and advocacy group action and legal protections than education for children without disabilities typically does.

Areas for Future Research

Given that alignment with the CRPD was not shown to correlate with higher enrollment rates, future research might examine variables that do impact enrollment. The topic related to *protection from discrimination* (Topic 16), for example, was associated with higher enrollment rates, perhaps indicating that countries focusing on this topic (Botswana, Singapore, and Australia) demonstrated better implementation of public education for CWD. The topic related to *teacher training* (Topic 7) was also highly correlated with the dominant CRPD topic (see Figure 5), indicating that this detail of implementation may also be a promising future measure of more effective legislation for the public education of CWD.

Of additional interest, comparing countries in similar regions and with similar funding for special education may shed light on other aspects of effective legislation or contextual importance for implementation. For instance, future studies may describe the differences in contexts between Rwanda (with a 29% enrollment rate for CWD, spending 5% of GDP on education), Ghana (with an 81% enrollment rate for CWD, spending 5.5% of GDP on education), and Botswana (with a 75.8% enrollment rate, spending 9.6% on education). Further, it may be interesting to examine these differences by describing the social movements within each of these contexts that allows children with disabilities to be included in education more fully. Additionally, it may be possible to examine aspects of such social movements through computer-assisted methods of text analysis of social and other media within these countries. Though this may be made more difficult by the popularization of encrypted social media applications that make the harvesting of representative samples of such data impossible.

Alternative approaches to examining social movements in these (or other comparable countries) might examine the roles of stakeholders in these spaces. For example, the lives, views, and motivations of children with disabilities and their families might be described by researchers, in order to look for patterns in perceived barriers to education and priorities for CWD in the contexts in which they live. This might be especially important work in a country such as Rwanda, where the only available publications are written by one primary researcher. Increasing discourse in such settings would require increasing the number of voices participating in the discussion, or the visibility of stakeholders. A network analysis of the organizations present in Rwanda and providing services to CWD may also illuminate strengths on which these organizations are built as a potential blueprint for additional capacity building. However, it is also understandable that in the absence of drinkable water and sufficient classroom facilities in such contexts for any children, the voices of CWD may not be heard distinctly among the clamor for resources from the majority of voices requesting basic materials for educational access.

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Appendix A

Table 2

Data Included in the Structural Topic Model Analysis

Country	Law Type	Language	Data Year Enrollment	Data Year GDP	Percent CWD Enrolled	Percent GDP Spent on Education	Parts of the CRPD Signed
Argentina	Gen. Ed.	Spanish	2010	2010	80.5	5.2	4
Australia	Ed. of CWD	English	2011	2010	99	5.1	3
Botswana	Const.	English	2011	2009	75.8	9.6	0
Brazil	Ed. of CWD	Portuguese	2010	2010	75	5.6	4
Cameroon	Ed. of CWD	French	2008	2008	73.4	2.6	2
Chile	Gen. Ed.	Spanish	2004	2004	94.4	3.5	4
Egypt	Const.	Arabic	2012	2012	1.85	3.8	2
Ghana	Gen. Ed.	English	2010	2010	81	5.5	4
Greece	Ed. of CWD	Greek	2010	2010	15	4	4
India	Ed. of CWD	English	2009	2009	65.88	3.3	2
Italy	Ed. of CWD	Italian	2013	2013	99.6	4.2	4
Japan	Ed. of CWD	Japanese	2006	2006	99.9	3.3	2
Luxembourg	Ed. of CWD	French	2014	2014	100	4	4
Mexico	Gen. Ed.	Spanish	2014	2014	84	5.3	4
Nicaragua	Ed. of CWD	Spanish	2009	2010	59.02	4.5	4
Peru	Gen. Ed.	Spanish	2016	2016	50	3.8	4
Romania	Gen. Ed.	Romanian	2011	2011	67	3	3
Rwanda	Ed. of CWD	English	2014	2014	29	5	2
Singapore	Gen. Ed.	English	2016	2013	98	2.9	2
South Africa	Gen. Ed.	English	2011	2011	89.2	6	4
Spain	Gen. Ed.	Spanish	2008	2008	97	4.5	4
Tanzania	Ed. of CWD	English	2012	2012	84.2	6.2	4
Thailand	Ed. of CWD	Thai	2015	2013	50	4.1	2

Turkey	Ed. of CWD	Turkish	2010	2010	93	4	3
United States	Ed. of CWD	English	2010	2010	96.5	5.6	1
Venezuela	Const.	Spanish	2011	2011	73.6	5.1	2
Zimbabwe	Gen. Ed.	English	2013	2013	33	7.4	2
CRPD	Ed. of CWD	English	2006	2006	100	4.8	4

Appendix B

Table 3

Stop Words Lists

Most Common 174 English Stop Words List From TM Package in R
I, me, my, myself, we, our, ours, ourselves, you, your, yours, yourself, yourselves, he, him, his, himself, she, her, hers, herself, it, its, itself, they, them, their, theirs, themselves, what, which, who, whom, this, that, these, those, am, is, are, was, were, be, been, being, have, has, had, having, do, does, did, doing, would, should, could, ought, I'm, you're, he's, she's, it's, we're, they're, I've, you've, we've, they've, I'd, you'd, he'd, she'd, we'd, they'd, I'll, you'll, he'll, she'll, we'll, they'll, isn't, aren't, wasn't, weren't, hasn't, haven't, hadn't, doesn't, don't, didn't, won't, wouldn't, shan't, shouldn't, can't, cannot, couldn't, mustn't, let's, that's, who's, what's, here's, there's, when's, where's, why's, how's, a, an, the, and, but, if, or, because, as, until, while, of, at, by, for, with, about, against, between, into, through, during, before, after, above, below, to, from, up, down, in, out, on, off, over, under, again, further, then, once, here, there, when, where, why, how, all, any, both, each, few, more, most, other, some, such, no, nor, not, only, own, same, so, than, too, very

Custom Procedural Stop Words List
Law, article, section, chapter, append, sub-sect, paragraph, title, act, decre, etc, herein, update, sen, part, provis, title, decree

Appendix C

Table 4

Sources and Years for CWD Enrollment Data

Country	Data Source	Year
Argentina	UNICEF	2010
Australia	Australian Bureau of Statistics	2011
Botswana	Statistics Botswana	2011
Brazil	UNICEF	2010
Cameroon	Cockburn, et al. (2017)	2008
Chile	Institute of National Statistics, Chile	2004
Egypt	Center for Economic and Social Rights (2014)	2012
	Egyptian Ministry of Education (2014)	
Ghana	Republic of Ghana, Ministry of Education (2013)	2010
Greece	European Parliament (2013)	2010
India	EdCIL (India) & Social & Rural Research Institute (2010)	2009
Italy	European Parliament (2013)	2013
Japan	Ministry of Education, Culture, Sports, Science and Technology, Elementary and Secondary Education Bureau, Special Needs Education Division (2006)	2006
Luxembourg	European Agency for Special Needs and Inclusive Education (2015)	2014
Mexico	National Institute of Statistics and Geography, Mexico (2014)	2014
Nicaragua	Pineda, A. (2014) final report for the Japan International Cooperation Agency	2009
Peru	National Institute of Statistics and Information, Peru (2012)	2016
	United Nations Human Rights Office of the High Commissioner (2016)	

Romania	European Commission (2016)	2011
Rwanda	UNICEF, Education Development Trust (2016)	2014
Singapore	Ministry of Education, Singapore (2017)	2016
South Africa	Statistics South Africa (2011)	2011
Spain	European Parliament (2013)	2008
Tanzania	Government of the United Republic of Tanzania, National Bureau of Statistics and Ministry of Finance (2012)	2012
Thailand	UNICEF (2015)	2015
Turkey	UNICEF (2012)	2010
United States	United States Census Bureau (2011)	2010
Venezuela	Bolivarian Republic of Venezuela (2014)	2011
	Observer of public expenditure, Venezuela. (2015)	
Zimbabwe	Swedish International Development Cooperation Agency, Sida. (2014)	2013

Appendix D

Table 5

Output from the labelTopic Function in STM with Manually Determined Topic Titles in Parentheses

Topic 1
("Establishment of Public Education for PWD"):
Develop, institute, nation, will, level, establish, process, system, right, ministry, state, program, quality, basic, profession, object, respect, community, promot, modal
Topic 2
("Public Availability of Laws Governing Education of PWD"):
Will, center, student, teach, block, administer, subject, organ, establish, publish, public, correspond, art, school, regul, may, language, provis, degree, evalu
Topic 3
("Regional Education Structure for PWD"):
Educ, special, school, decis, staff, depart, minist, posit, public, service, issu, teacher, administer, train, follow, region, relev, nation, affair, member
Topic 4
("Requirements for Teachers of Students with Disabilities"):
School, special, educ, support, revis, licens, provis, disable, teacher, deaf, high, person, blind, student, staff, children, standard, number, establish, will
Topic 5
("Establishing Related Program Access for PWD"):
Research, univers, sport, school, teach, youth, ministry, institute, nation, unit, higher, staff, studi, organ, program, accord, shall, may, doctor, public
Topic 6
("Legal Procedures"):
Feder, author, fraction, will, provis, school, general, public, state, reform, shall, amend, offici, nation, issu, secretary, journal, follow, page, servic
Topic 7
("Teacher Training"):
Will, train, necesari, social, school, particip, promot, provis, council, ensur, scienc, organ, technolog, action, teacher, equal, service, system, children, author
Topic 8
("Provision of Educational Services"):
Shall, school, may, govern, colleg, member, term, person, subsect, author, minist, central, provid, board, secretari, committe, registr, offic, institut, state
Topic 9
("Rights of PWD"):
Disabl, person, shall, state, right, parti, access, includ, committe, appropri, ensur, equal, present, measure, convent, provid, promot, organ, take, communic
Topic 10
("Education for PWD"):
Educ, teacher, accord, student, teach, train, within, evalu, nation, level, establish, need, learn, take, institut, parent, includ, regul, privat, administer

Topic 11
("Special Education Structure"):
Shall, minist, council, person, relat, service, institute, provid, nation, committee, may, mean, public, provis, matter, bodi, polici, function, employ, consult
Topic 12
("Procedural"):
Year, establish, council, student, ministri, may, case, shall, one, board, two, respect, offici, school, secondari, requir, general, appropri, year, school, prior, may
Topic 13
("Procedural"):
State, agenc, disable, shall, children, service, child, provid, local, secretary, parent, relat, include, require, general, appropri, year, school, prior, may
Topic 14
("Evaluation of Student Needs"):
Special, individu, institute, program, school, student, train, servic, teacher, work, class, need, famili, evalu, develop, monitor, prepar, busi, require
Topic 15
("Funding Structure"):
Disable, page, peopl, special, govern, manag, servic, institut, fund, promot, organ, person, develop, director, local, office, public, adminstr, basic, need
Topic 16
("Protection from Discrimination"):
Person, disabl, discrimin, relat, commiss, provis, unlaw, subsect, assist, purpos, employ, mean, anoth, commission, ground, requir, anim, person, commonwealth, reason
Topic 17
("Inclusion"):
Disabl, person, refer, social, public, service, health, handicap, provid, integr, school, work, specil, region, minist, art, prevent, rehabilit, support, within

Appendix E

Table 6

Laws in the Final Corpus

Country	Law	Type of Law	Year
Argentina	National Education Law No 26.206	General Education	2006
Australia	Disability Act	Special Education	1992, rev. 2005
Botswana	National Policy on the Integration of Persons with Disabilities	Special Education	2002
Brazil	National Policy for the Integration of Persons with Disabilities, Decree No. 3.298	Special Education	1989, rev. 1999
Cameroon	Law No. 2010/002	Special Education	2010
Chile	General Law of Education No. 203702	General Education	2009
Egypt	Constitutional Amendments 80 and 81	Constitution	2014
Ghana	Education Act	General Education	2008
Greece	Law of 2817/2000, Education of Persons with Special Educational Needs and Other Provisions	Special Education	2000
India	Persons with Disabilities Act	Special Education	1996
Italy	Law 104/1992, Framework Law on the Assistance, Social Integration, and Rights of Handicapped Individuals	Special Education	1992, rev. 2014
Japan	School Education Law Revised for Promotion of Special Support Education	Special Education	2006, rev. 2007
Luxembourg	The Integration Law	Special Education	1994

Mexico	General Education Law	General Education	1992
Nicaragua	Law 202	Special Education	1995
Peru	General Law of Education	General Education	2003
Romania	National Education Law 1/2011	General Education	2011, rev. 2016
Rwanda	Law No. 01	Special Education	2007
Singapore	Compulsory Education Act	General Education	2001, rev. 2018
South Africa	National Education Policy Act	General Education	1996
Spain	Organic Law of Education	General Education	2006
Tanzania	Persons with Disabilities Act	Special Education	2010
Thailand	Education for the Disabled Persons Act BE 2551	Special Education	2008
Turkey	Regulation of Special Educational Services Act	Special Education	2000
United States	Individuals with Disabilities Act	Special Education	1975, rev. 1978, rev. 2004
Venezuela	Article 81 of the Venezuelan Constitution	Constitution	2009
Zimbabwe	Education Act	General Education	1987

Appendix F

Table 7

Papers Included for Case Studies

Authors (Year)	Country	Groups studied	Setting
Abdelhameed, H. (2015)	Egypt	Parent (n = 100) and teacher perceptions (n = 100) of inclusive schooling for children with intellectual disabilities via survey. Interviews with selected respondents (n = 38).	1 special education school and one primary general education school in Ismaila Governate
Ali, A. (2018)	Egypt	In-service teachers of English as a foreign language (n = 218)	Gharbia governate, cluster sampling of teachers in primary public schools
Alkhateeb, J., Hadidi, M., & Alkhateeb, A. (2015)	United Arab Emirates, Jordan, Saudi Arabia, and Egypt	Literature review of inclusion of children with developmental disabilities in Arab countries from 1990 to 2014	Egypt (2 studies, identified for inclusion in this review)
Anderson, J. & Boyle, C. (2015)	Australia	Literature review of the management of inclusive education	All 8 educational jurisdictions in Australia
El-Ashry, F. (2009)	Egypt	Pre-service general education teachers at Kafrelsheik University (n = 1625)	Kafr El Sheik Governate
Emam, M. & Mohamed, A. (2011)	Egypt	71 pre-k teachers and 95 primary teachers	No specific sampling information given (beyond the sample being from Egypt)
Forlin, C. (2006)	Australia	Literature review of inclusive education	All 8 educational jurisdictions in Australia

Graham, L. & Spandagou, I. (2011)	Australia	13 primary school principals representing 8 out of 10 school regions in the state	New South Wales
Karangwa, E., Ghesquiere, P., & Devlieger, P. (2007)	Rwanda	Discussion paper on barriers and facilitators of inclusion for children with disabilities in Rwanda	Rwanda
Karangwa, E., Miles, S., & Lewis, I. (2010)	Rwanda	Interviews with 35 family and community members of children with disabilities, 89 community leaders, and 201 school-community members	Schools in the Kigali, Umutara, and Kibuye provinces
Sharma, U. (2014)	Australia	Literature review of current practices in special education	All 8 educational jurisdictions in Australia
Subban, P. & Sharma, U. (2006)	Australia	122 primary school teachers	Victoria
Tiat, K. & Hussain, R. (2017)	Australia	51 parents of children with disabilities participated in the survey. 17 parents participated in a follow-up interview.	Rural areas of New South Wales
Van Kraayenoord, C. (2012)	Australia	Review of current practices in inclusive education across Australia	All 8 educational jurisdictions in Australia
Wormnaes, S. (2008)	Egypt	Teachers who were professional development participants (n = 29)	Cairo